THE physical therapy REVIEW

Volume 34 - Number 2 February 1954

Physiological Considerations in Rehabilitation — SPENCER

State Registration of Physical Therapists

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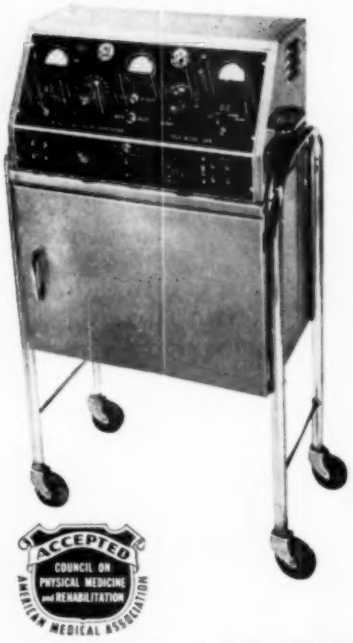

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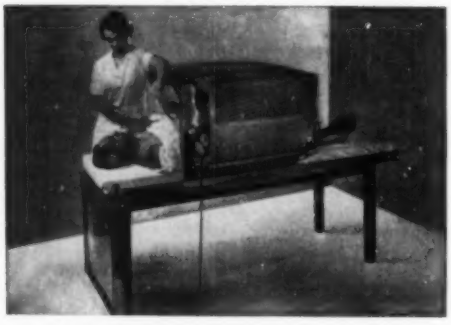

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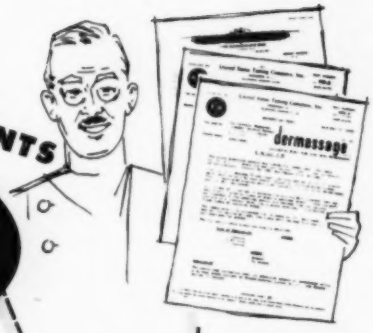

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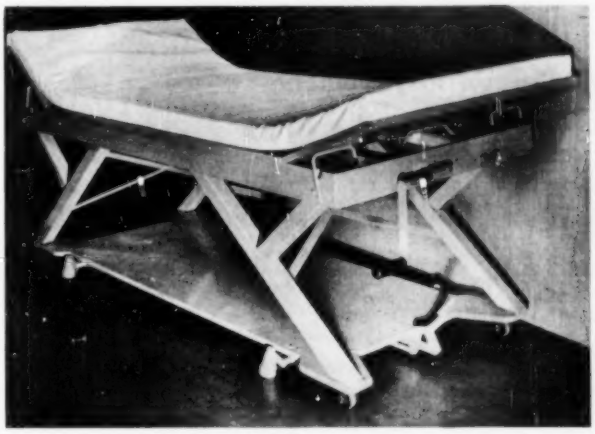

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Vol. 34 February 1954 Number 2

Physiological Considerations in Rehabilitation

William A. Spencer, M.D.

Rehabilitation is an integrated, dynamic process presenting physiologic, psychologic, sociologic aspects. Physiological rehabilitation is that part of the total process which achieves for the individual the optimum adjustment of the varied physiologic responses produced by disease or trauma. A broad definition of physiology is a requisite for the orderly consideration of such responses.

Physiology, the study of body functions, describes the manner in which the whole of the systems of the body interrelate in carrying out normal activities and adapting to minor and major stresses. For this reason physiological information is essential for the proper treatment of disease or injury. Such treatment includes those measures which are needed to aid or supplement the favorable reactions of the body, the replacement of functions which fail, and the neutralization of harmful reactions. Ideally then, extensive physiological understanding should be sought.

A beginning has been made in this task of studying the complex human organism in operation and documenting the complete reaction to disease or injury. The method is slow and laborious and progresses along several avenues which include: (1) The analysis of many body activities under steady or constant artificial test conditions; (2) the correlation of lower animal experimental observations as they may apply to humans; and (3) the demonstration of the pattern and extent of the reaction of body functions when disease or injury occurs.

A discussion of current concepts concerning general body activities will clarify the application of physiologic knowledge in treatment. First, it appears likely that body activities require the interrelated participation of the central nervous system, effector systems, and supportive functions. The central nervous system directs and coordinates the activity of effector systems such as the muscular system, while cellular metabolism continues by virtue of the integrated support of external respiration, circulation, absorptive, and excretory processes. The performance of a specific activity such as walking requires in effect the coordinated function of the body as a whole. The central nervous system initiates, directs, and coordinates the patterns of muscular contraction which result in the walking movement. At the same time the muscle cells are doing the chemical work of contraction they require the support of increasing supplies of oxygen and nutrient materials as well as the elimination of end-products such as carbon dioxide. This is achieved by adjustments in respiration, circulation, and renal excretion.

Presented at Annual Conference of the American Physical Therapy Association, Dallas, Texas, June, 1953. From the Departments of Pediatrics and Physiology, Baylor University College of Medicine, Houston, Texas, and the Southwestern Poliomyelitis Respiratory Center, supported by an annual grant-in-aid from the National Foundation for Infantile Paralysis, Inc.

Secondly, the various systems have reserve capacity which permits the expansion or contraction of the extent of their activity plus an ability to use alternative pathways toward the same end result. This flexibility makes it possible to meet changes in the needs of the body as a whole, which may range from sleep to extreme physical activity on the one hand or severe disease and injury on the other. These ranges of adaptation are exemplified by the respiratory system. Breathing or the movement of gases in and out of the lungs may increase 25 fold, from 4 to 5 liters per minute to 200 liters per minute. During strenuous exercise an increased supply of oxygen is necessary for increased body metabolism. Several pathways for meeting this demand are to be found. Availability of oxygen is expanded by greater movement of air into the lungs, easier transfer of oxygen molecules from the lung sacs to the blood, and increasing the quantities of blood passing through the lungs. In addition, a more complete utilization of the oxygen in the blood with each cycle is accomplished. Thus the demand for more oxygen is satisfied in several directions and total oxygen uptake may range ten fold from 0.25 liters per minute to 2.5 liters per minute. In such a fashion several systems participate in accomplishing the same end. Even at the cellular level reserve capacity for work can be found. Muscle cells are capable of the chemical work of contraction without oxygen for brief periods by virtue of the breakdown of stored high-energy carbohydrate compounds. At the same time the biochemical activity of the body cells can proceed only if the environment of the cell is suitably regulated as to fluid and electrolyte content, a function subserved chiefly by the kidney.

Another important characteristic of these body systems is the economy with which their work is performed. In terms of energy expenditure, the rate and depth of quiet breathing is selected to demand the minimum work on the part of the muscles of breathing. Expansion of activity in this instance proceeds from the point of maximum efficiency.

Finally it seems likely that reserves are capable of development by utilization so that the very process of adjusting to increasing demand, increases the capacity for work. Muscle cells are capable of enlargement and greater work capacity by increased usage. In general, this development is accomplished gradually just as growth is gradual. Limits exist to which a given function may develop, but the extent of this limit directly depends upon the time allowed for adjustment to increasing work. Muscle cells fatigued by excessive use are incapable of doing the amount of work achieved by gradual increase in usage without exhaustion. Apparently the limits of activity vary in different systems, in different individuals in the species, and in the same individual from time to time.

A particular unity is recognized in these concepts. First stated by Claude Bernard and later amplified by Sir Joseph Barcroft, this interrelated adaptability of the body achieves the maintenance of a remarkably constant environment for the body cells. This constancy is a requisite for the optimum function of the most elaborate and versatile part of the whole, the central nervous system, which after all, first senses, then initiates, directs, and coordinates many body activities. Because of this it is probable that the price of perfected brain function is the necessary delicacy with which the supportive activities operate.

This appraisal of body function emphasizes the possible complexity of the complete reaction to an unstabilizing event. The total reaction to disease or injury appears in two parts: the specific part such as the damage of a nerve or muscle or bacterial infection of a body tissue, and the general effect upon the body as a whole. Indications of the general response may be elevation of body temperature and changes in metabolism. Broadly stated, the general response usually accomplishes the adjustments necessary to correct the specific defect while continuing activity in the best possible manner when some part is operating improperly. Nonetheless this state of affairs results in discomfort, the degree depending upon the magnitude of the insult and the direction of the compensating responses. It should be apparent that when treatment is necessary it must take into account the specific effects and the general way in which the body is reacting, as well as the physiologic effects of the procedures utilized. It is also clear that treatment must be specifically aimed to eliminate the offending condition if possible, and also general or symptomatic as it is an aid to preserving optimal body function. Attention to the foregoing generalizations is important because the physical therapist is directly concerned with physiological rehabilitation.

Physical therapists are familiar with some of the specific effects of the diseases which they treat. They are aware of the pain and limitation of motion that result from injury to a muscle or bone and the diminished strength of muscle contraction which accompanies paralysis. Their experience appreciates the effect of physical measures in mobilization, increasing muscle strength, and improvement in local blood circu-

lation using radiant energy. This does not need emphasis nearly so much as the manner in which their treatment procedures influence body function and the patient's capacity to tolerate the physiologic work required. Most physical therapy procedures involve work and adaptation on the part of some or all of the body system. This work commences during simple passive treatment procedures and may become extreme during full physical activity. The capacity to tolerate this work can vary from time to time and if not exceeded, takes into account the general condition of the patient and the clinical evidences of uncompromised body function.

The most pertinent decision which arises during treatment is the timing of the amount of inactivity and activity. In no other important way is it possible to meet the need for gradual increase in physiologic work within the tolerance of the patient. There are both advantages and disadvantages to activity and inactivity, posing a fundamental dilemma. The solution to this dilemma is required since inactivity has been a paramount part of the treatment of disease. The need for some inactivity was best stated by W. S. Tillett: "(1) Reducing the demand exacted by physical exertion on a cardiovascular and respiratory system rendered incompetent by disease; (2) eliminating pain and alleviating other distressful symptomatology and anxiety referable to physical movement; (3) promoting the sustained approximation of healing surfaces by immobilization; (4) fixing as much as possible areas of acute inflammation; and (5) arresting hemorrhage and preventing its recurrence."

The crux of the dilemma can be appreciated by detailing some of the physiologic reactions in activity and inactivity. These reactions concern the circulatory and metabolic effects of immobilization, the effect of position and radiant energy such as heat in the circulatory response of normal man. This will be of especial value as a preface to the more complex response of the diseased patient.

In a study of the respiratory, circulatory, and metabolic effects of immobilization in normal individuals, Deitrick, Whedon, and Shorr demonstrated that prolonged inactivity particularly influenced metabolism and circulation. Immobilization was produced by plaster casting of the entire body. Some of the metabolic effects upon urinary excretion of nitrogen, total sulfur, and potassium are indicated in figure 1.

Increased excretion of nitrogen and potassium during the period of immobilization is demonstrated in this graph. Other data indicated increased urinary excretion of calcium and phos-

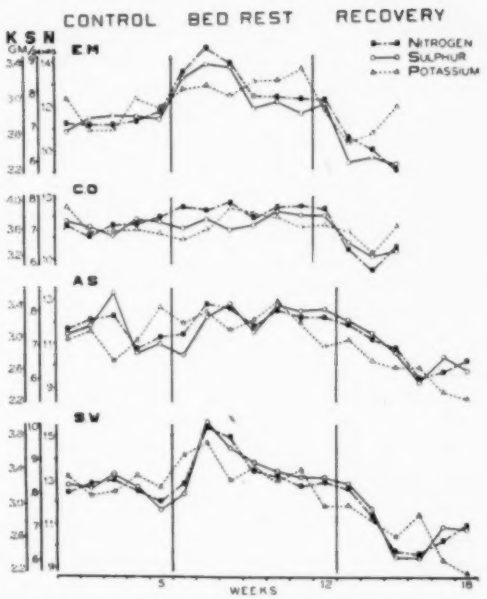


Figure 1. Effect of immobilization on the urinary excretion of nitrogen, total sulfur, and potassium of four normal male subjects. *(Reprinted with permission of the publisher, from Deitrick, J. D., Whedon, G. D. and Shorr, E. American Journal of Medicine, 4:1948, p. 14.)*

phorus. Nitrogen loss is related to the loss of body tissue, and the loss of phosphorus, sulfur, and potassium was proportional to that found in muscle protoplasm. Impairment in creatine and creatinine excretion occurred and coincident with this, there was a definite decrease in muscle mass and in muscle strength in immobilized limbs. Return to normal activity reversed all of these effects.

Circulatory changes were also noted and were believed to be due to a "deterioration" in the mechanism essential for adequate circulation. Figure 2, taken from this same paper indicates an inability to compensate for the effect of gravity in the erect position.

In contrast to the pre-immobilization period, pulse rate increased to a greater degree in tilting, pulse pressure decreased more severely and in some a tendency to faint developed. The authors concluded that besides the deterioration in the circulatory mechanism, venous engorgement, increased extravascular fluid, and impairment in venous and muscle tone accounted for the effects observed.

The effect of gravity in increasing the capil-

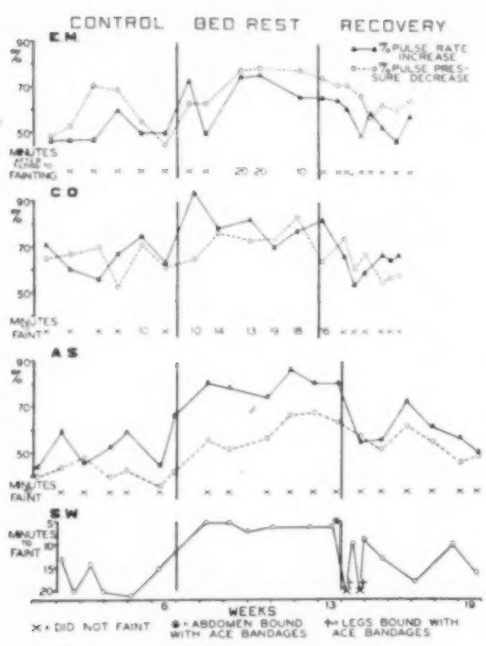


Figure 2. Effect of immobilization on the responses of pulse rate and pulse pressure to tilting to 65 degrees feet downward for 20 minutes in four male subjects. *(Reprinted with permission of the publisher, from Deitrick, J. D., Whedon, D. G. and Shorr, E. American Journal of Medicine, 4:1948, p. 20.)*

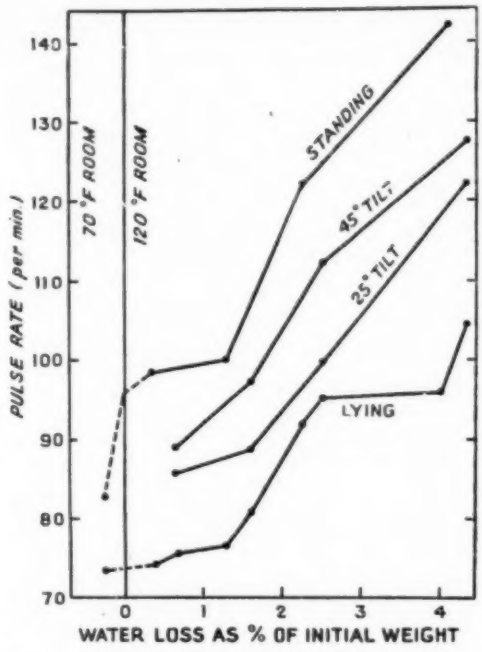


Figure 3. Relation between pulse rate and posture in a man exposed to external heat in whom progressive dehydration developed as a result of profuse sweating. *(Reprinted with permission of the publisher, from Adolph, E. F. and Associates, "Physiology of Man in the Desert," Copyright 1947, Interscience Publishers, New York–London, p. 176.)*

lary pressure and promoting the dependent pooling of blood in lax blood vessels is well documented. In normal man compensation for this gravitational effect maintains the return of blood to the heart so that cardiac output is sustained and fainting does not occur. Immobilization apparently interferes with the ability to achieve this and normal activity tends to preserve it. During periods of immobilization no important respiratory effects have been observed by methods now available to evaluate respiration.

If additional stress is added to the effect of gravity, such as increased environmental temperature, an excessive circulatory response is noted in normal man. This response is aggravated if dehydration and electrolyte loss from excessive sweating is allowed to develop. (S. Wright)

The responses noted in figure 3 illustrate how exposure to external heat with salt and water loss produce progressively increased pulse rate. These pulse rate changes are further increased if the additional effect of gravity is brought into play such as changing from the lying to the standing position. The requirements of various types of environmental stress upon the heart rate and thus upon the work of the heart can become additive. This demand may not be met when there are inadequate circulatory reserves.

The circulatory and metabolic effects of muscular exercise are important since active physical therapy measures require such exercise.

Two functional requirements of physical work are illustrated in figure 4. From this graph it is clear that strenuous muscular exercise in this particular subject is accompanied by an increase in heart rate from 70 beats per minute to 184 beats per minute. Even after three minutes of recovery it is also obvious that neither heart rate nor oxygen consumption approach pre-exercise levels. This pattern of response is characteristic of normal persons. During violent exercise oxygen requirements may exceed supply and the deficit incurred will require increased consump-

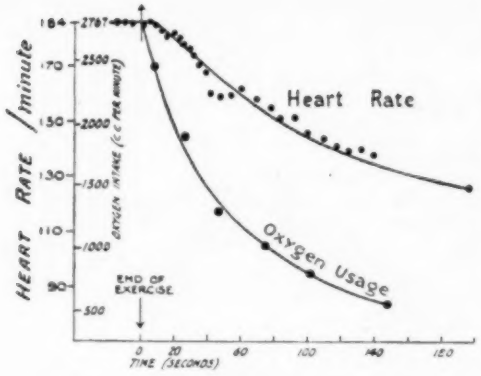


Figure 4. Recovery phase after severe muscular exercise (standing-running). The resting values for heart rate and oxygen consumption were 70 beats and 250 cc per minute. *(Reprinted with permission of the publisher, from Wright, S. "Textbook of Applied Physiology," Oxford University Press, London, 1952, p. 440.)*

tion for a prolonged period. Although physical therapy exercise may not be so violent, a suitable capacity for circulatory and metabolic adjustments may not be available for even moderate exercise when these reserves have been depleted by disease or prolonged immobilization.

With the increase in heart rate in muscular exercise, an increase in the volume of blood flow through the active member occurs coincidently. (R. T. Grant)

The increase in arm blood flow expressed as a per cent change in limb volume during exercise is illustrated in figure 5. This appears to be directly related to the duration of the exercise. Such a change in arm blood flow is consistent with the needs of working muscle and accounts in part for the circulatory effect of exercise. It also serves to indicate the diminished circulatory demand of the muscular system during the resting state. In addition, exercise increases the demand for cooling and subsequent increase in skin circulation.

Since it has been possible to show some of the circulatory consequences of immobilization, exercise, and the effect of gravity in normal persons the response of patients to similar factors is in order. The circulatory response of the patient who has been immobilized because of extensive paralytic poliomyelitis can be expected to be similar to normal man in many respects. There are, however, important differences which undoubtedly result from individual variation in the degree of respiratory, circulatory, and metabolic insufficiency. In all of the examples, the patients have involvement of the muscles of the extremities, trunk, and abdomen. The figures 6a, b, c, and d illustrate different responses of the pulse rate and blood pressure to the assumption of an erect position. This change in position from the lying to the standing was obtained by tilting the patient passively on a mechanical bed which gradually assumed a near vertical 70 degree position in a period of 4 to 6 minutes. The patients were strapped securely with an abdominal binder and the lower extremities were wrapped tightly with elastic bandages to minimize the pooling of blood in dependent parts.

The response of pulse rate and blood pressure illustrated in figure 6a is similar to that of a normal person, since there is a slight increase in pulse rate and marked elevation of diastolic blood pressure with a 20 per cent decrease in pulse pressure as the nearly erect position is attained. Nearly eight minutes elapse before the values approach the control period. This near normal response is unexpected since it occurs in a completely paralyzed individual who has been immobilized for a protracted period.

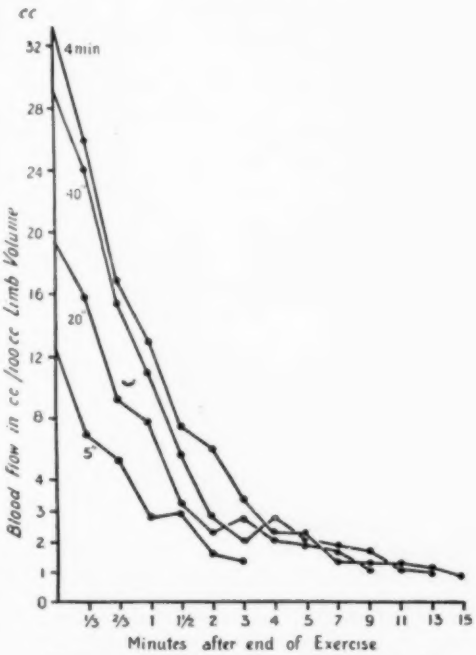


Figure 5. Arm blood flow following exercise. *(Reprinted with permission of the publisher, from Wright, S. "Textbook of Applied Physiology," Oxford University Press, London, 1952, p. 434.)*

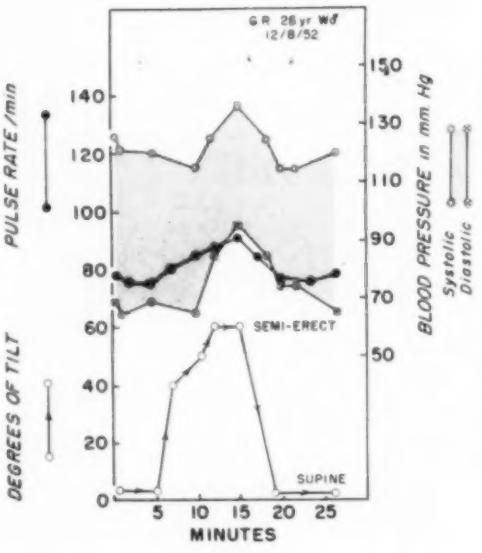


Figure 6a.

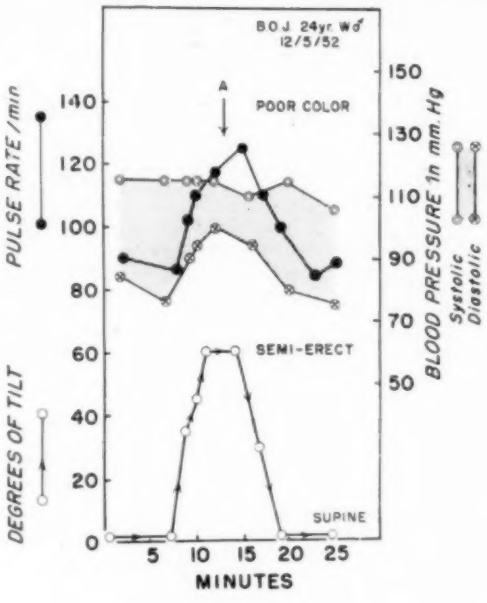


Figure 6b.

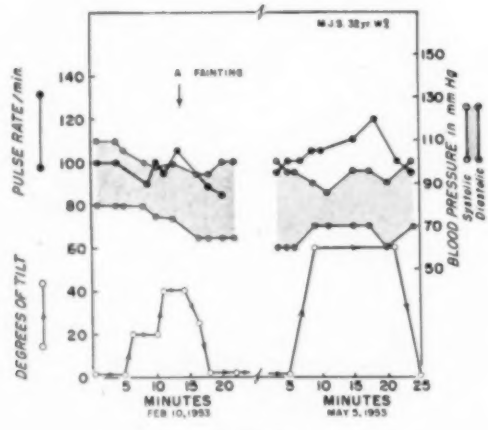


Figure 6c.

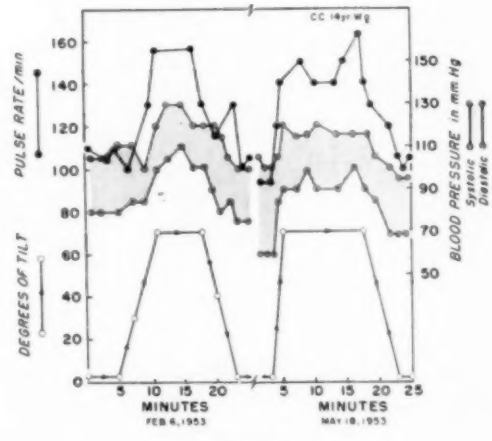


Figure 6d.

Figures 6a, b, c, and d. Response of pulse rate and systolic and diastolic blood pressure in respiratory poliomyelitis patients with extensive generalized flaccid muscular paralysis changing from the supine to the semi-erect position. Passive tilting of the patient from the supine position to the semi-erect position was obtained by means of a mechanical table electrically operated for constant rate of ascent and descent, degree of tilt expressed as angle of inclination toward the vertical, horizontal reference zero degrees, semi-erect 60 to 70 degrees. Patients strapped with abdominal and lower extremity binders, elastic bandages applied to the lower extremities. *(Data courtesy of L. K. Smith, Physical Therapist.)*

A more exaggerated increase in pulse rate and extreme diminution of the pulse pressure is demonstrated in figure 6b. Poor peripheral circulation was noted in association with the small pulse pressure.

A reverse change in pulse rate with slowing and a progressive decline in diastolic blood pressure after only a brief exposure to the semi-erect position of forty degrees is demonstrated in figure 6c. This patient was the only one of the group with fairly good muscle function in the lower extremities. Three months later, the same individual developed a more characteristic response with increase in pulse rate and elevation of diastolic blood pressure in addition to tolerating a vertical position for a longer period.

The pattern of pulse rate and blood pressure response to the vertical position during a three month period is shown in figure 6d. This patient has the most exaggerated response of pulse rate in the group. It should be considered unusual because of the magnitude of the change. It is noteworthy that even in the supine position the resting values for blood pressure and pulse rate are increased.

The preceding graphs are significant primarily because they indicate different responses in different individuals as well as differences in the same individual at various times. Such data does not permit inference as to what degree the specific effects of the disease influence the observed response over and above immobilization. These considerations are pertinent because progressive physical therapy involves increasing muscular exertion and the assumption of the erect position. Whether this is accomplished within the safe tolerance of the patient depends upon the application of the individual clinical estimation of the physiological assets and liabilities such as the response of the vital signs to the therapeutic program.

When a broad program of patient evaluation is carried out and includes not only circulatory but respiratory and metabolic assessments, some crude sort of regulation of physical therapy activity can be achieved. In such a program it is valuable to observe the response of the vital signs of pulse and blood pressure over long periods of time. The following three figures illustrate three of the most common patterns to be found in paralytic poliomyelitis patients with respiratory muscle paralysis. It should be pointed out that the values indicated by the graph represent averages of two and three day study periods during which pulse and blood pressure observations are made before, during and after every phase of the daily program for 24 hour periods. Thus in each instance hundreds of observations are compressed to show the general trends.

Figures 7a, b, and c show response of pulse and blood pressure in poliomyelitis patients with respiratory muscle paralysis in the course of a progressive rehabilitation program.

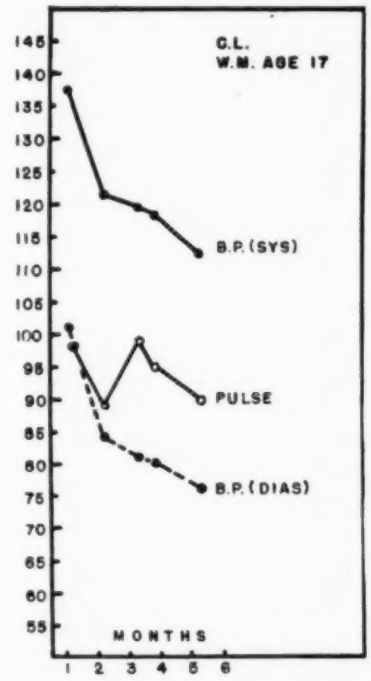


Figure 7a. Five points determining pulse and systolic and diastolic blood pressure values averages of 87 separate determinations obtained during two day study periods.

This patient demonstrated a progressive decline in pulse rate and blood pressure to normal values over a six-month period. During this time it was possible for the patient to resume some unassisted breathing. At first all therapeutic efforts were tolerated poorly so a progressive and gradual scheduling of increasing activities including physical therapy and the assumption of a sitting position was essential. Sitting posture permitted functional rehabilitation of the upper extremities. This pattern of initially increased pulse rate and blood pressure responses was as-

sociated with poor tolerance of minimal activity. Gradually these values returned to normal, with the achievement of considerable increase in activity.

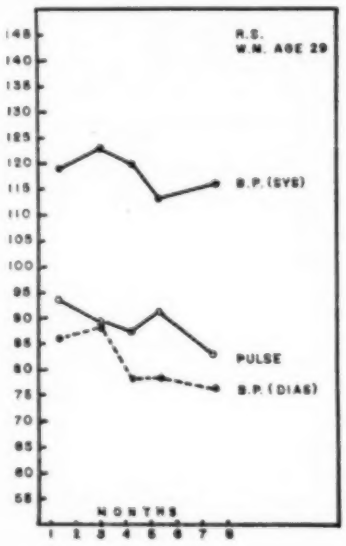


Figure 7b. Five points determining pulse and systolic and diastolic blood pressure values averages of 71 separate determinations obtained during two day study periods.

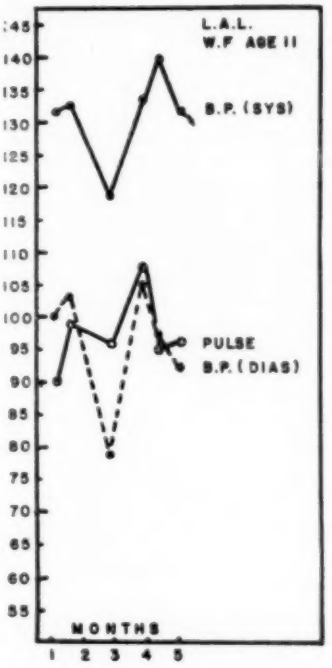


Figure 7c. Six points determining pulse and systolic and diastolic blood pressure values averages of 105 separate determinations obtained during two day study periods.

This patient's pulse rate and blood pressure values as shown in this figure were nearly normal at the onset of the rehabilitation program and were associated with good tolerance to a progressive increase in spontaneous breathing time and increasing use of the upper extremities. The pulse rate and diastolic blood pressure showed a slight decrease to normal values consistent with the age of the patient. Complete resumption of normal breathing was possible as well as a wheel chair existence at home with excellent performance in self help activities.

Considerable variation in pulse rate, systolic and diastolic blood pressure are noted in figure 7c. The lability of these vital signs was associated with inability of the patient to tolerate spontaneous breathing or any active physical therapy procedures. In addition, persistent clinical and electrocardiographic evidence of myocardial insufficiency was found. Complete dependence upon artificial respiration and the use of only passive procedures to prevent severe deformity were necessary if cardiac embarrassment was avoided.

Change in body position may effect pulmonary ventilation. A 5 per cent decline in the sitting vital capacity (the maximum amount of air which can be exhaled after a maximum inspiration) is found in comparison to the supine value. Ordinarily this is of little consequence because it represents such a small proportion of the possible ventilatory effort. When these muscular reserves are diminished because of poliomyelitis paralysis, differences in body position may markedly influence the efficiency of the work of the remaining muscles.

The changes observed in the vital capacity of 35 poliomyelitis patients with various kinds and degrees of respiratory muscle paralysis is illustrated in figure 8. In the majority of patients the vital capacity in the sitting position decreased on the average about 20 per cent. In some instances the decrease is highly significant when it is realized that many of these patients had maximum effort values which only approached the

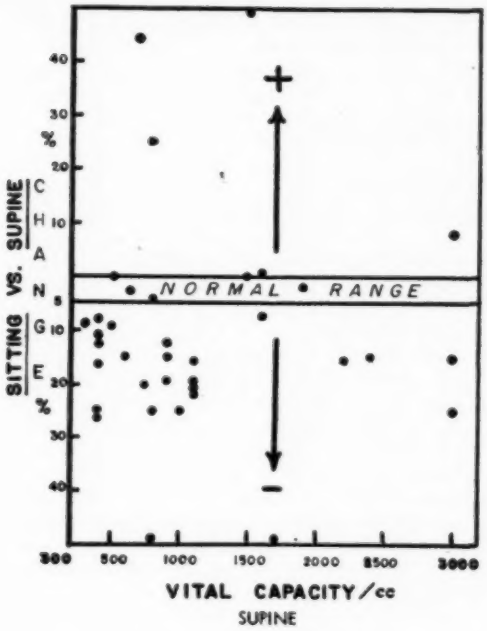


Figure 8. Change in vital capacity in supine and sitting position of 37 respiratory poliomyelitis patients with respiratory muscle paralysis and extensive generalized flaccid muscular paralysis. Observed sitting vital capacity plotted as increased or decreased percent change of the observed supine vital capacity along the ordinate. Sitting values plotted in relation to actual supine vital capacity in cc along the abscissa.

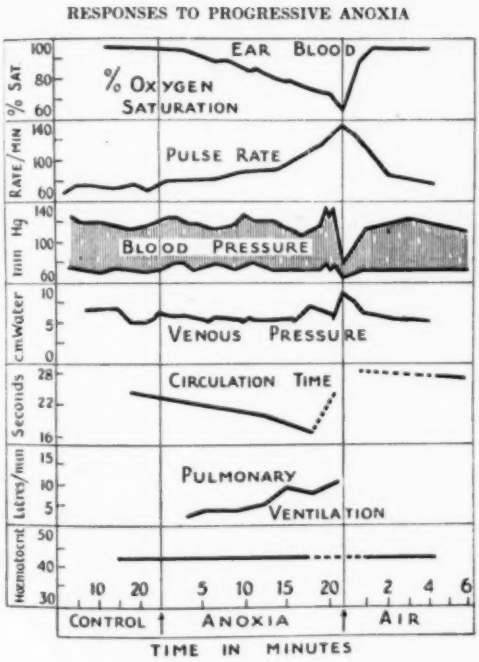


Figure 9. Circulatory and respiratory responses to progressive anoxia in man. After a control period the subject rebreathed from a bag containing air, through soda lime to absorb CO_2; the experiment was terminated when the subject fainted. The percentage saturation of the arterial blood with oxygen fell from 95 to 65; the pulmonary ventilation gradually increased from 4 to 10 litres per minute; the circulation time initially fell from 24 to 17 seconds (suggesting increased cardiac output); the pulse rate rose from 65 to 130 per minute. In the blood pressure record, upper line—systolic, lower line—diastolic, shaded area—pulse pressure. The blood pressures remained unchanged for the first 20 minutes of anoxia. Just before consciousness was lost, systolic and diastolic blood pressure fell abruptly, the venous pressure rose, and the circulation time was lengthened, indicating acute heart failure. On breathing air normal conditions were restored. The haematocrit value was unchanged throughout; i.e., there was no change in red cell concentration and no evidence of discharge of stored red corpuscles. *(Reprinted with permission of the publisher, from Wright, S. "Textbook of Applied Physiology." Oxford University Press, London, 1952, p. 399.)*

volumes necessary for ordinary quiet breathing. In this regard patients who could breathe adequately in the supine position were unable to avoid underventilation in the sitting position. On the contrary in five instances vital capacity increased in the sitting position so that such patients could better tolerate sitting than lying from the standpoint of breathing. Apparently the diaphragm is partially splinted by sitting so that if most of the complete breathing effort is accomplished by this muscle, embarrassment in ventilation may develop as a result of sitting.

Oxygen insufficiency and carbon dioxide accumulation are the two important biochemical deficiences resulting from inadequate pulmonary ventilation. The response of the circulatory and respiratory system to rapid progressive oxygen insufficiency is represented in figure 9.

These responses which included elevation of pulse rate, venous pressure and prolongation of the circulation time are considered indications of cardiac stress. With intact breathing musculature, respiratory rate and depth increase in a compensatory effort. Adaptation to longstanding underventilation with less severe anoxia and

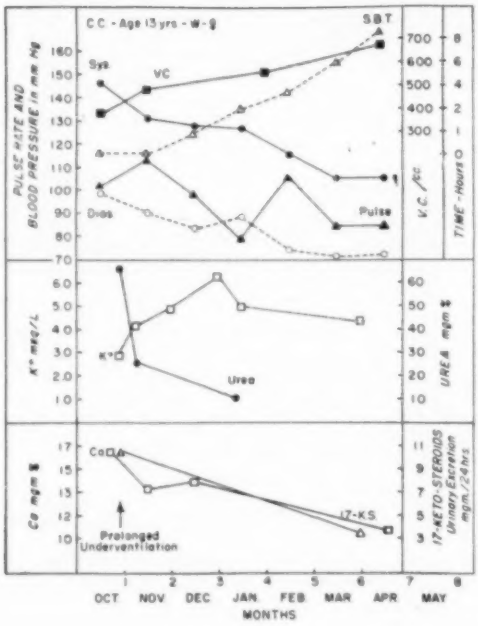


Figure 10. Respiratory, circulatory, and metabolic determinations in a 13 year old white female respiratory poliomyelitis patient with extensive generalized flaccid muscular paralysis. Initial values were secured following a period of prolonged underventilation prior to admission, patient four months post onset of the disease. During the first month indicated on the graph, patient was placed on complete inactivity and constant artificial respiration. Following this, patient managed with a progressive respiratory and physical medical rehabilitation program.

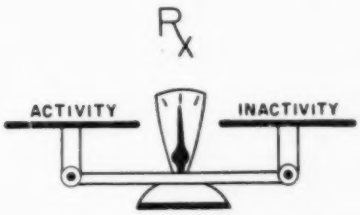
considerable carbon dioxide retention is associated with elevated blood pressure and pulse rate and important metabolic disturbances including an acid shift of the blood hydrogen ion concentration.

Figure 9 is valuable as a preface to the circulatory effect of prolonged underventilation because it emphasizes the need of increased cardiac work as part of the adjustment to this situation. If the capacity of inadequate breathing musculature is exceeded in an effort to achieve spontaneous breathing, prolonged underventilation develops. Cardiovascular and metabolic adjustments are then added to the progressive exhaustion of the muscles of respiration. Such injudicious activity represents the most severe kind of stress. It is also evident that this unbalanced state of affairs prevents the maximum improvement which might be obtained in such a body function as respiration.

Respiratory, circulatory, and metabolic measurements in a 13 year old patient who had severe paralytic poliomyelitis with involvement of most of the skeletal musculature including the respiratory muscles are demonstrated in figure 10. She had been forced over a period of weeks, prior to admission, to resume spontaneous breathing for periods of time in excess of her capacity to sustain adequate pulmonary ventilation. Prolonged underventilation then produced profound disturbances in body function. Cardiovascular signs included hypertension, rapid heart rate, and clinical and electrocardiographic evidence of heart failure. Metabolic disturbances included alterations of fluid and electrolyte regulation with hypopotassemia and renal failure indicated by increased blood urea. Gastrointestinal malfunction occurred with hemorrhage, distension, and an inability to retain injested food. Changes in endocrine balance occurred. This entire sequence of events was reversed by return to constant artificial respiration and complete inactivity for one month in addition to general supportive measures. The figure illustrates the dramatic decline in systolic and diastolic blood pressure (mean values from study periods), less significant changes in pulse rate, improvement in vital capacity from 400 to 700 cc. and permissible spontaneous breathing from zero hours to eight and one-half hours. In addition prompt reversion of the abnormal blood serum potassium and urea levels occurred. Over the succeeding months, careful progressive scheduling of physical therapy activities including hydrotherapy, breathing exercises, assumption of the sitting position, and some functional training of the upper extremities was paced by the clinical and laboratory evaluations of the respiratory, circulatory, and metabolic status of the patient. Most important is the demonstration of an ultimate increase in effective spontaneous respiration above the functional level which initially represented a severe physiological compromise.

SUMMARY

This discussion has developed from general considerations of physiological principles which have a bearing in the rehabilitation procedures most directly concerning the physical therapist. The examples have included normal responses of the circulatory, respiratory, and metabolic systems to immobilization and a variety of physical factors. To emphasize by extreme examples, the responses of patients with severe paralytic



BALANCE THE PHYSIOLOGIC ASSETS AND LIABILITIES AS THEY ACCRUE FROM THE EFFECTS OF THE DISEASE UPON THE BODY, ITS CONSTITUTION, ITS RESPONSES, AND THE TREATMENT PROCEDURES.

poliomyelitis have been included. The cumulative effects of such physical factors as well as respiratory, circulatory, and metabolic responses to severe stress are documented. Brevity has been necessary to achieve an orientation toward the crucial problem of balancing the degree of physical activity and inactivity which meets the optimum needs of the patient. This tolerance is dependent upon his changing responses during the course of rehabilitative procedures and convalescence from disease.

The proper prescription for the patient should therefore include the balancing of physiological assets and liabilities resulting from the specific effects of the disease, the general response of the body functions, and the effect of treatment procedures. It would be incorrect to indicate that this can always be achieved. Such an accomplishment awaits much more extensive and elaborate application of physiological knowledge to the "disease state" than has been demonstrated in this discussion. Since balancing the therapeutic program for the physiologic needs of the patient is dependent upon clinical empiricism, emphasis should be placed upon the physical therapist's participation and inclusion in the medical team pacing this program. In no other fashion can individual adjustment of the kind and degree of physical therapy measures be adapted to the moment to moment needs of the patient traversing the recovery process.

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4. Ibid, p. 20.
5. Wright, S.: Textbook of Applied Physiology, Oxford University Press, London, 1952, p. 478.
6. Ibid, p. 440.
7. Grant, R. T.: Clinical Science, 3:1938, p. 168 — Data Chart Table 1.

Our Book Reviewers for February

Frances D. Alterman, Chief, Physical Therapy, VA Hospital, Oteen, North Carolina.

Virginia L. Frost, Captain WMSC, Chief Physical Therapy, U. S. Army Hospital, Fort Bragg, North Carolina.

William J. Shriber, M.D., Director, Physical Medicine, Beth Israel Hospital, Boston; Assistant in Medicine, Massachusetts General Hospital, Boston.

Agnes P. Snyder, Major WMSC, Chief Physical Therapist, Physical Therapy Clinic, Walter Reed Army Hospital, Washington, D. C.

Caroline Goss Thompson, Director, Occupational Therapy, University of Wisconsin, Madison.

State Registration of Physical Therapists

Nineteen states plus the Territory of Hawaii now have legislation regarding registration for physical therapists. Practice without registration is prohibited by law (mandatory) in Arizona, Maryland, New Mexico, New York, Pennsylvania and Wisconsin. In all other states use of the title Registered Physical Therapist or similar designations is forbidden to those who are not registered in the state (permissive).

As far as can be determined, reciprocity is provided for in the following states: Arizona, Arkansas, Connecticut, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Hampshire, North Carolina, Oklahoma, South Carolina, Washington and Wisconsin.

For the information of our members we have abstracted pertinent sections of each law.

ARIZONA—An Act "Relating to Professional and Business Pursuits; Creating the Board of Physical Therapy Examiners, Prescribing Its Powers and Duties; Prescribing Examination and License to Practice Physical Therapy; Providing for Revocation or Suspension of Licenses; Providing for Reciprocity Certificates and Certificates to Present Practitioners; Prescribing Fees for Licenses; and Prescribing Penalties." Signed March 12, 1952.

A person desiring to engage in the practice of physical therapy must have a certificate of registration as a physical therapist issued by the Board of Physical Therapy Examiners (three members who meet the requirements of the American Medical Association, reside in the state and are registered or eligible for registration under the provisions of this Act). It is unlawful to practice without a certificate. Candidates must apply for examination (application fee $5.00, examination fee $25.00) and must have satisfactorily completed a course in physical therapy approved by the American Medical Association. Examinations will be held by the board during the month of April and September.

Certificate of registration must be recorded in the office of the county recorder of the county in which the registrant resides. Those registered must not practice independent of the prescription, direction or supervision of a licensed physician or surgeon. Certificates of registration are for three years and must be renewed for additional three year periods at a fee of $5.00.

Reciprocity is provided for those registered in a state or territory having standards at least equal to those in this Act and which grant a similar privilege to those registered under the laws of this state. Fee $5.00.

Address: The Board of Physical Therapy Examiners
Phoenix, Arizona

ARKANSAS—"Physical Therapists Practice Act" signed February 16, 1953.

The Board shall register as a Physical Therapist each applicant who proves to the satisfaction of the Board his fitness for registration under this act. Applicants must have been graduated by a school of physical therapy approved for training by the appropriate Subcommittee of the American Medical Association. A person not registered under this act may not indicate that he is a registered physical therapist and/or physical therapist. A person registered under this act as a physical therapist shall not treat human ailments by physical therapy except under the prescription and direction of a person licensed to practice medicine and surgery.

Physical therapists registered in other states where requirements are substantially equal and where a similar privilege of registration is accorded may be registered without examination.

The fee for non-residents is $30.00 The fee to residents is $5.00. Renewal of registration is required every third year at a fee of $5.00.

The Board of Registered Physical Therapists consists of the Board of Medical Examiners and three registered physical therapists.

Address: The Board of Registered Physical Therapists:
Joe Verser, M.D., Secretary
Harrisburg, Arkansas

CALIFORNIA—"Physical Therapists Practice Act" effective September 9, 1953.

Physical therapists who were practising physical therapy on or prior to September 9, 1953 may be issued certificates as registered physical therapists upon submitting satisfactory evidence:

a) that under the direction of a physician and

surgeon licensed by the state of California they have practiced physical therapy for not less than three years either in a hospital, sanitarium, clinic or office within a five year period immediately prior to application or;

b) that they have taught physical therapy for not less than one year in a school of physical therapy approved by the Board of Medical Examiners within a five year period immediately prior to application or;

c) that on or prior to September 9, 1953 they graduated from a school or course of physical therapy approved by the Board.

Persons who have been administering physical therapy for one year or more in the Medical Corps of the U. S. Army, or in the Medical Service Corps of the United States Navy prior to Sept. 9, 1953, and who hold certificates of training, may be registered without examination before Sept. 9, 1955.

For purposes of b) and c) above the Board shall approve each school of physical therapy that proves to the satisfaction of the Board that it complies with the essentials of an acceptable school of physical therapy promulgated by the Council on Medical Education and Hospitals of the American Medical Association.

After September 9, 1954 the Board will examine applicants for registration and may employ registered physical therapists to aid in such examinations which shall include practical demonstrations and written and oral tests.

Application fee for examination is $25.00. An annual registration fee of $2.00 must be paid on or before the first day of January of each year. A person not registered under this chapter may not represent himself as a registered physical therapist.

A registered physical therapist shall not treat human ailments by physical therapy except under the supervision and direction of a physician and surgeon.

Address: Mr. Wallace W. Thompson, Asst. Secretary
Board of Medical Examiners of the State of California
1020 N Street
Sacramento, 14, California

CONNECTICUT—An Act concerning the Licensing of Physical Therapist, approved June 19, 1953.

The Connecticut State Board of Examiners for Physical Therapists consisting of three physicians and two physical therapists certifies physical therapists for registration who are graduates of a school of physical therapy approved by the Board and successfully pass an examination to show proficiency in physical therapy and related subjects. Certificates issued by the State Department of Health constitute a license to practice physical therapy under the written prescription, direction and supervision of a person licensed in this state to practice medicine and surgery as specified by law. Fee for examination $20. Fee for certificate $2.

The Board may certify without examination an applicant registered under the laws of another state or territory of the United States, any province of Canada or any other country if their requirements for registration were at the date of her registration substantially equal to those of this state and if a similar privilege is accorded. Application fee $10. Certificate $2.

Certificates must be renewed annually.

No person not registered with the State Department of Health may imply that he is a registered physical therapist in this state.

Address: John C. Allen, M.D.
Secretary-Treasurer
Board of Examiners for Physical Therapists
Hartford Hospital
Hartford, Connecticut

FLORIDA—"Physical Therapists Practice Act" filed June 11, 1951.

Graduates of approved schools, who are U.S. citizens, may apply to the Board (Board of Examiners in the Basic Sciences and the State Board of Medical Examiners who employ three registered physical therapists to aid in examinations) for applications for Registration. The application fee is $25.00. Examinations are held the first Tuesday in May and the first Tuesday in November in Tallahassee.

Examinations include written and oral tests and practical demonstrations. Applicants are first required to obtain certificates of proficiency in basic science by passing an examination in the basic sciences of anatomy, physiology, and pathology as they apply to physical therapy.

Only those who are registered in Florida may use RPT or similar designations. Those so registered must practice only under the prescription, direction and supervision of a person licensed by the State of Florida to practice medicine. Registered Physical Therapists must register every year with the State Board of Health and pay a fee of one dollar.

Reciprocity is not provided.

Address: Homer L. Pearson, M.D., Secretary
State Board of Medical Examiners
701 du Pont Building
Miami, Florida

GEORGIA—"Physical Therapists Practice Act" approved February 19, 1951.

Registrants of the American Registry of Physical Therapists may be registered without examination at the discretion of the State Board of Medical Examiners by filing application and paying a fee of $5.00. Other graduates of approved schools must apply to the board, pay $25.00 and take an examination. Three registered physical therapists are to be employed to aid in such examinations which include practical demonstrations and written or oral tests of the applicant's fitness. Registration must be renewed during January of every third year at a fee of $5.00.

Those who practice independently of the prescription, direction or supervision of a person licensed in Georgia to practice medicine and surgery without limtations, may have their registration revoked.

Only those registered under this Act may imply that they are registered physical therapists.

Reciprocity is provided for physical therapists registered by other states having substantially equal requirements and according a similar privilege.

Address: Mr. R. C. Coleman, Joint Secretary
State Examining Board
State Capitol
Atlanta, Georgia

ILLINOIS—"Illinois Physical Therapy Registration Act" approved August 3, 1951.

One desiring a certificate of registration as a physical therapist must be either a citizen of the U. S. or have made declaration of intention to become a citizen, and having made such declaration of intention have filed a petition for naturalization within thirty days after becoming eligible to do so.

Education and Professional Requirements:

(1) Has graduated from a high school or secondary school approved by the Department; and

(2) Has: (a) completed at least sixty semester hours of work including satisfactory courses in biology and the physical sciences in a college or university approved by the Department; or (b) Graduated from a school of physical education approved by the Department; or (c) Graduated from a school of nursing approved by the Department; and

(3) Has completed to the satisfaction of the Department an approved course in physical therapy given in a school of physical therapy approved by the Department, such school being established in a medical school, hospital, college or university approved by the Department, which course shall embrace the following:

SUBJECTS	*Min. Clock Hrs. of Theory*	*Min. Clock Hrs. of Practice*	*Min. Clock Hrs. of Theo. & Prac.*	*Qualif. of Instruct.*
1. Applied Sciences				
Anatomy			210	Physician instructor or other qualified in specialty
Pathology	30			
Physiology	30	45		
Psychology	15			
2. Procedures				
Electrotherapy	25	40		Physician or qualified physical therapist
Radiation Therapy	5	5		
Hydrotherapy	5	15		
Massage	10	45		
Therapeutic Exercise	30	75		
3. Physical Therapy as applied to:				
Medicine	15	30		Physician for theory and a qualified physical therapist for practice
Neurology	10	15		
Orthopedics	15	30		
Surgery	15	30		
4. Ethics and Administration	5			Qualified physical therapist
5. Clinic practice			400	Physician and qualified physical therapist
6. Electives			50	Physician or other instructor qualified in the specialty

The Department means the Department of Registration and Education. Applicants must apply to the Department for Registration, pass an examination which embraces such subjects taught in approved schools of physical therapy and includes practical demonstrations and written and oral tests. The fee for examination is $10.00. The Board of Physical Therapist examiners is composed of three registered physical therapists and two licensed physicians.

Certificates must be renewed annually (in July) at a fee of $2.00. Practice independent of the prescription, direction and supervision of a person licensed to practice medicine in all of its branches or any system or method of treating human ailments without the use of drugs or without operative surgery is punishable by fine.

Reciprocity at the fee of $10.00, is provided at the discretion of the Department to those registered under other states, territories, provinces of Canada, where the requirements are substantially equal.

Address: Director, Department of Registration and Education of the State of Illinois
State House
Springfield, Illinois

MARYLAND—Chapter 906, Article 43 of the Annotated Code of Maryland, Title: "Health" — Sub-title: "Physical Therapy." Approved May 7, 1947. Amendment approved April 29, 1949.

Physical Therapists may make application for license to the Maryland State Board of Physical Therapy Examiners if they have graduated from a school of physical therapy accredited by that Board. The application fee is $10.00. Only those licensed may be known as physical therapists. No one may practice physical therapy in Maryland unless he is licensed. Those licensed must treat only patients diagnosed and referred by licensed medical doctors.

Reciprocity is provided for those licensed or registered in another state having requirements approved by the Maryland Board of Physical Therapy Examiners.

Annual renewal upon payment of renewal fee of $5.00. Any licensee who fails to make application for renewal of his or her license within three months of its expiration, accompanied by the required renewal fee, shall be refused a renewal until he or she shall have successfully passed the examination and paid the $10.00 fee.

Address: State Board of Physical Therapy Examiners
2411 No. Charles St.
Baltimore 18, Md.

MASSACHUSETTS—"Registered Physical Therapists Law," approved August 30, 1951.

Those desiring to be registered as physical therapists should apply to the Board of Registration in Medicine. They must be graduates of schools of physical therapy approved for training physical therapists by the appropriate subbody of the American Medical Association or if prior to 1936, the American Physical Therapy Association and pass an examination. The application fee is $25.00. The Board is to employ three registered physical therapists to aid it in examinations, the type of which shall be determined by the Board.

Registered Physical Therapists may not practice independent of the prescription, direction or supervision of a person licensed in Massachusetts to practice medicine and surgery without limitation.

Registration must be renewed every third year at a fee of $5.00. Those not registered may not imply that they are.

Reciprocity is provided without examination for those registered in other states having substantially equal requirements, upon payment of application fee of $10.00.

Address: Dr. Robert Cochrane, Sec.
Massachusetts Board of Registration in Medicine
Room 37
State House
Boston 33, Massachusetts

MINNESOTA—Sessions Laws, Chapter 479—H.F. No. 1585, Approved April 18, 1951.

The State Board of Medical Examiners will register as physical therapists those graduates of schools approved by the Board who pay a fee of $15.00, apply for and pass an examination.

The Examining Committee is composed of three physical therapists, one licensed and registered doctor of medicine in the general practice of medicine, and one professor or associate or assistant professor from a course in physical therapy accredited by the Board.

The Board may register without examination those who present satisfactory evidence of having passed the examination of the American Registry of Physical Therapists and pay $15.00.

Registration must be renewed annually in January with a payment of $3.00. Registered physical therapists may not practice independent of the prescription and direct supervision of a person licensed and registered in Minnesota to practice medicine and surgery.

Those not registered, may not represent themselves to be physical therapists.

Reciprocity is provided for those having standards as high as this state.

Address: Minnesota Board of Medical Examiners
230 Medical Arts Building
St. Paul 2, Minn.

NEW HAMPSHIRE—"Physical Therapy Practice Act," Approved March 20, 1951.

Registrants of the American Registry of Physical Therapists may be registered by the Board of Registration in Medicine without examination on application and payment of $5.00. Others must have completed an approved course in physical therapy in a school maintaining at that time a standard satisfactory to the Board, pass an examination and pay a fee of $5.00.

Two registered physical therapists are to be employed to aid in examinations. Registration must be renewed annually on or before December 31st at a fee of $1.00.

Practice independent of the prescription, direction or supervision of those licensed in this state to practice medicine and surgery is forbidden.

Those not registered may not represent themselves to be so.

Reciprocity is provided. Those registered in states whose requirements the Board deems equal to those of this state may be registered without examination on application and payment of the required fee of $5.00.

Address: J. S. Wheeler, M.D., Secretary
State Board of Reg. in Medicine
Concord, N. H.

NEW MEXICO—

It is unlawful for any person to practice or to offer his services in the capacity of or to purport to be a physical therapist or physiotherapist without having a license therefor and without being registered.

Graduates of schools of physical therapy having standards at least as high as those required for approval by the Council on Medical Education and Hospitals of the American Medical Association are eligible for licensing and registration.

The Physical Therapists Licensing Board consists of three physical therapists.

The Board determines by examination or otherwise those who possess the necessary knowledge and skill to practice physical therapy. Licenses will not be issued to those who have been guilty of unprofessional conduct which is defined as follows:

1. Acceptance for treatment of any patient other than upon the prescription, recommendations or referral of a physician licensed to practice medicine
2. Treatment of any patient by means, methods or in any manner other than that prescribed, recommended or advised by such patient's physician.

The application fee for registration and licensing is $25.00. Licenses must be renewed each year before June 1st for a fee of $5.00.

Address: Ruth A. Bauer, Registrar
Physical Therapists' Licensing Board
P.O. Box 2206
Santa Fe, New Mexico

NEW YORK—"Education Law, Article 131, Medicine; Osteopathy; Physiotherapy."

No person shall practice physiotherapy unless licensed by the department and registered as required by the article.

Physical therapist applicants for licensing and registration are required to have four academic years post secondary school training including graduation from a school of physiotherapy approved by the state education department.

Those who cannot qualify regarding specific education requirements may apply to the Board of Regents for special permission to take the examination under Section 211 of the Education Law.

Examination is required. The fee is $30.00 which includes first registration fee.

Examination is by the State Board of Medical Examiners and includes written and oral-practical tests (sometimes oral only, sometimes oral-practical, depending on examiner). They are usually given three times a year (October, February, June).

Renewal is required biennially. Re-registration fee is $2.00.

Reciprocity is not provided.

Further amendments to this law are still under consideration.

Address: Mr. Robert C. Killough, Ass't Commissioner
for Professional Education
State Education Department
23 South Pearl Street
Albany 7, N. Y.

NORTH CAROLINA — "Physical Therapists Practice Act," passed April 14, 1951.

A person who desires to be registered must be a graduate of a school of physical therapy ap-

proved by the appropriate subbody of the American Medical Association or if prior to 1936, by the American Physical Therapy Association. He must apply to the examining committee (four physical therapists, one doctor), pay $25.00 and successfully pass an examination. Registration must be renewed annually during January on payment of $5.00. Registered physical therapists may not practice independent of the prescription, direction and supervision of a person licensed in this state to practice medicine and surgery.

Those not registered may not represent themselves to be physical therapists. Reciprocity without examination is provided for those registered under the laws of another state if requirements are substantially equal, and the state accords a similar privilege. The application fee is $25.00.

Address: Maria M. Kennedy, Secretary
State Examining Committee of Physical Therapists
123 West 7th Street
Charlotte, N. C.

OKLAHOMA—"Physical Therapists Practice Act" Signed May 19, 1953.

The State Board of Medical Examiners and three physical therapists whom it appoints will examine applicants for registration as physical therapists. The board requires a grade of 75% in each subject for passing. Applicants must have been graduated by an approved school of physical therapy and pass an examination except where they are registered in a state where requirements are substantially equal and that state allows similar privileges of registration without examination. Registration fee $5.00.

The examination fee is $25.00.

Physical therapists registered under this act may not undertake to practice physical therapy independent of the prescription, supervision and direction of a person licensed in this state as a physician or surgeon with unlimited license.

Only those holding certificates as Registered Physical Therapists as issued by the board may use the title Registered Physical Therapist. Registration must be renewed annually during the month of January at a fee of $5.00.

Address: State Board of Medical Examiners:
Mrs. Lucy Haidek, Secretary
813 Braniff Building
Oklahoma City, Oklahoma

PENNSYLVANIA

Admission to the practice of physiotherapy in the State of Pennsylvania is granted by the State Board of Medical Education and Licensure by the issuance of a license to the candidate who passes the licensing examination and satisfies all other legal requirements. The Board will accept for admission to the examinations, graduates from physiotherapy schools approved by the Council on Medical Education and Hospitals of the American Medical Association providing the credentials of the applicant meet the other requirements of the Board (four year high school course, completion of professional course, 21 years of age, good moral character, not addicted to the use of alcohol or narcotic drugs).

The fee is $25.00. Examinations are held during the month of July in Philadelphia and Pittsburgh and during the month of January in Philadelphia. Practice must be upon the direction of a physician or other person authorized by law to order physiotherapy.

Renewal annually—before December 31st of each year. Fee $1.00. Pennsylvania does not reciprocate with any of the states in the matter of physiotherapy licensure.

Address: Mrs. Marguerite Glass Stiener, Executive Secretary
Board of Medical Education and Licensure
Commonwealth of Pennsylvania
Harrisburg, Pa.

SOUTH CAROLINA—"The Physical Therapists Practice Act," approved February 29, 1952.

To be eligible for registration by the board as a physical therapist each applicant must meet the following professional requirement: Be a graduate of a school of physical therapy approved by the appropriate subbody of the American Medical Association if such school existed at the time of his graduation; or if graduated prior to 1936, then the school or course which was approved by the American Physical Therapy Association at the time of his graduation.

Examination is required. The State Board of Examination and Registration of Physical Therapists will consist of at least three and not more than five members nominated by the South Carolina Physical Therapy Association, Inc., and approved by the governor and registered under this act. Examination will be held at least once a year. The fee is $10.00.

Registered physical therapists must apply for extension of registration annually and pay a fee of $2.00. Reciprocity is provided on payment of a fee of $10.00 for physical therapists registered in states or territories where the requirements are substantially equal if the state accords a similar privilege to this state.

Any person not registered may not call himself a physical therapist or indicate by any other words, letters, or insignia that he is a registered physical therapist. Those who are registered may not treat human ailments except under the direction, supervision and prescription of a person licensed to practice medicine or surgery.

Address: State Board of Examination and Registration of Physical Therapists
Columbia, South Carolina

WASHINGTON—"Physical Therapists Practice Act." Approved by the Governor, March 22, 1949.

Graduates of schools of physical therapy approved for training physical therapists by the appropriate subbody of the American Medical Association or prior to 1936, by the American Physical Therapy Association, may apply for examination for registration as physical therapists by the Examining Committee of Physical Therapists (at least 3 physical therapists). The fee is $25.00.

Those registered may not practice except under the prescription, supervision and direction of a person licensed in this state to practice medicine and surgery. Those not registered may not represent themselves to be.

Registration must be renewed during the month of January every third year and the fee is $5.00.

Reciprocity is provided for those registered under the laws of other states if requirements are substantially equal. The fee is $25.00.

Address: Mr. Edward C. Dohm
Professional Division
Department of Licenses
Olympia, Washington
or
Miss Gudrun Tandberg, R.P.T.
Chairman of Examining Comm.
8623—41 S.W.
Seattle 6, Washington

WISCONSIN—Statutes Relating to Physical Therapy Effective July 11, 1953.

No person shall practice or hold himself out as authorized to practice physical therapy or designate himself as a physical therapist without a certificate of registration issued by the Board of Medical Examiners nor unless he practices under a prescription and the direct supervision of a person licensed to practice medicine and surgery.

Applicants for certificates of registration must have been graduated from schools of physical therapy with standards of training substantially equivalent to that of the University of Wisconsin and pass a scientific and practical examination given by a state examining committee consisting of three physical therapists. Examination fee $15.00.

Those who are licensed or certified in other states or foreign countries with standards determined by the board to be as high as those of this state may be issued certificates of registration without examination at a fee of $10.00.

The board may also issue without examination a permit to practice physical therapy for not to exceed 6 months to any person who meets the qualifications of this section upon certification that he has been assigned to this state on a temporary basis to assist in a medical emergency. Permit fee $2.00.

Certificates of registration must be renewed annually on or before January 31 at a fee of $3.00.

Address: Examining Committee for Physical Therapy
Emma Zitzer, Secretary
207 N. Brooks St.
Madison, Wisconsin

TERRITORY OF HAWAII—Chapter 19, "Physiotherapists or Physical Therapists" Approved April 28 1945.

No person shall designate himself as a physical therapist except under a valid and effective permit issued by the Board of Health of the Territory of Hawaii. Permits are issued to those who have graduated from schools of physical therapy approved by the Council on Medical Education and Hospitals of the American Medical Association, are members in good standing of the American Physical Therapy Association, the American Registry of Physical Therapist or the Chartered Society of Physiotherapists. Physical examinations are required. There is no registration fee.

Permittees may not practice except under the supervision of or on referral from a duly licensed physician in the Territory.

Permits must be renewed annually and X-ray examinations of the chest must be obtained.

Address: Dr. Charles L. Wilbar, Jr., President
Department of Health
Honolulu 1, Hawaii

Suggestions from the Field

A Splint for Facial Paralysis

Lt. Georgia M. McKearly, (NC) USN,
and Lt. Anne M. Stankavitch, (NC) USN

In treating any paralyzed portion of the body every effort is made to maintain maximum function. To accomplish this, emphasis is placed on proper position, keeping up muscle tone, and maintaining adequate circulation. Since supportative appliances frequently are an adjunct to treatment we developed a malleable hook splint for use in the treatment of Facial Paralysis.

The appliance is made of flexible aluminum wire 2 mm. diameter and 7 mm. long, covered with thin rubber tubing. The wire is bent to form a loop through which a rubber band is attached, and the opposite end is molded in the form of a hook, 1 inch in depth (Figure 1).

The relaxed muscles of the face are supported by the upward and lateral traction produced when the hook is placed inside the corner of the mouth, and the rubber band is looped over the ear (Figure 2).

Physical therapists, US Naval Hospital, St. Albans, New York.

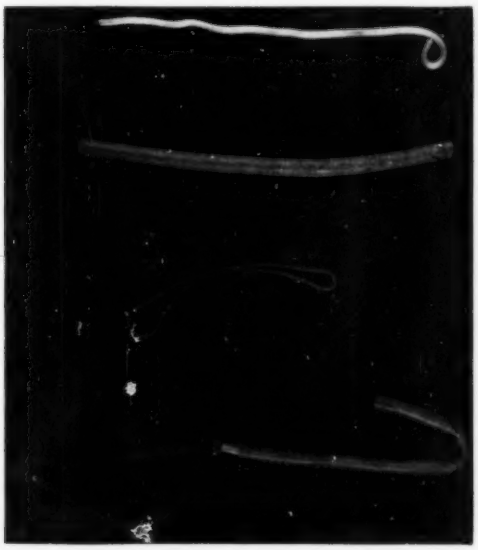

Figure 1. Components of splint. Aluminum wire, rubber tubing, and rubber band.

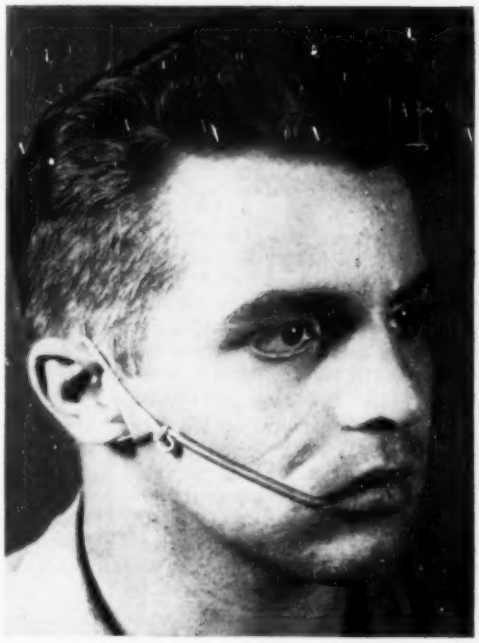

Figure 2. Splint supporting stretched muscles in place.

The splint is adjustable to the needs of the patient, and the material used in its construction is easily available.

Lt. Georgia M. McKearly attended Loyola University for her B.S. degree and St. Elizabeth Hospital School of Nursing for her nursing preparation. She received her certificate in physical therapy from Baruch Center of Physical Medicine, Richmond, Virginia.

Lieutenant McKearly was on the nursing staff, St. Elizabeth Hospital, Chicago, and as a nurse corps officer has held the position of physical therapist at US Naval Hospitals in Great Lakes, Illinois; Camp J. H. Pendleton, Oceanside, California; and St. Albans, New York.

Lt. Anna M. Stankavitch completed requirements for her physical therapy certificate at Baruch Center of Physical Medicine, Richmond, Virginia, and was awarded a nursing certificate from Kings County Hospital School of Nursing, Brooklyn, New York. Lieutenant Stankavitch holds a B.S. degree from New York University.

Prior to her tour of duty in the US Naval Corps, she was a member of the nursing staff at King's County Hospital. She has served as physical therapist at various naval installations, including US Naval Hospitals at St. Albans, New York, and Key West, Florida.

Both Lieutenant McKearly and Lieutenant Stankavitch are members of the American Physical Therapy Association and the American Registry for Physical Therapists.

Suggestions from the Field

Temporary Crutch Lengthener

Gordon Kober, B.S.

Occassionally there is a need for a method of adding temporary length to a pair of crutches. The physical therapist cannot always tell quickly exactly how much length is necessary to help each patient's particular gait problem. Wooden blocks of varying thicknesses have been used under the crutches, but this method is practical only for standing and balancing, not for actual gait.

A reasonable solution to this problem was devised by the Gonzales Warm Springs Foundation brace shop. It is a "temporary crutch lengthener" constructed to slip easily over the rubber tip of any ordinary crutch. This simple device has four prongs, two of which are beveled to grasp the crutch tip firmly and yet allow ease in application.

Hard rubber discs of one-quarter inch thickness are placed within the pronged device making it possible to add up to one and one-quarter inches to the length of any crutch. One disc is attached permanently to the bottom of the device to give rubber contact with the floor.

This "temporary crutch lengthener" simplifies determining the required length for the patient's permanent crutches, and facilitates changing the length when this becomes necessary.

This device was built by George Christian and photographed by Robert Wilson both of Gonzales Warm Springs Foundation.

Staff Physical Therapist, Warm Springs Foundation, Gonzales, Texas.

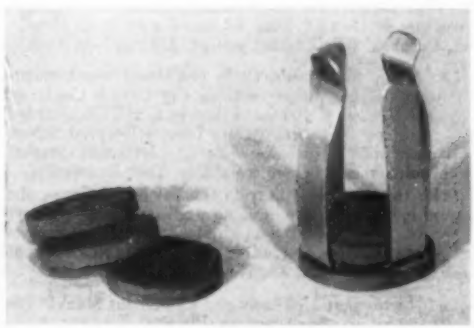

Figure 1.

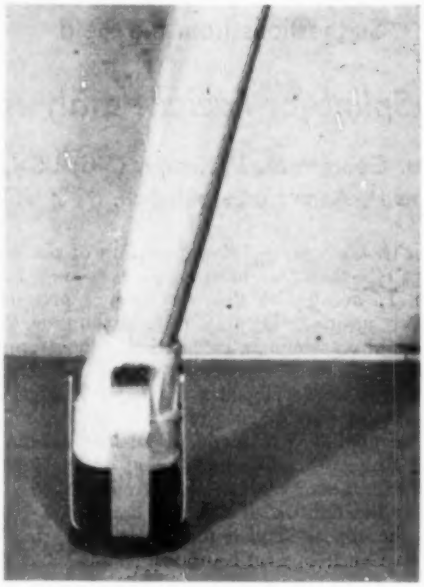

Figure 2.

Gordon Kober received his B.S. degree from Springfield College and his physical therapy certificate from the University of Pennsylvania. He is a member of the American Physical Therapy Association and the American Registry of Physical Therapists.

Chapter Membership Transfers

Each month the National Office notifies all chapters of address changes which have been received in the office during the month. When the member has moved into an area under the jurisdiction of another chapter, the new chapter is notified of the membership transfer and adds the member's name to the chapter's membership list. It is therefore especially important that we receive address changes promptly so that we will be able to notify the chapters concerned and prevent any interruption in the member's participation in chapter activities and discussions.

Schools of Physical Therapy

APPROVED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS
OF THE AMERICAN MEDICAL ASSOCIATION

Graduates of these schools are eligible for membership in the American Physical Therapy Association.

Name and Location of School	Medical Director and Physical Therapy Director	Degree, Certificate or Diploma	Length of Course	Entrance Requirements	Classes Start
CALIFORNIA					
School of Physical Therapy Childrens Hospital Society 4614 Sunset Blvd., Los Angeles 27 (Affil., U. of Calif., L.A.)	Samuel S. Mathews, M.D. Mrs. Mary J. Dodge	Degree	4 yrs.	1–3–4	Sept. and Feb.
		Certif.	14 mos.	4–5	Sept.
School of Physical Therapy Col. of Med. Evangelists White Memorial Hospital Boyle & Michigan Aves., Los Angeles 33	F. B. Moor, M.D. R. Wm. Berdan	Certif.	15 mos.	2–3–4–5–6–7	Sept.
Dept. of Physical Therapy U. of Southern Calif. U. Park, Los Angeles 7	Chas. L. Lowman, M.D. Charlotte W. Anderson	Degree	4 yrs.	1–3–4	Sept. and Feb.
		Certif.	14 mos.	2–5–6	Sept.
Curriculum in Physical Therapy, School of Med., U. of Calif., 3rd and Parnassus, San Francisco 22	Lucile Eising, M.D. Mrs. Margery L. Wagner	Degree	1 yr.	4	Sept. and Feb.
		Certif.	12 mos.	5	Sept. and Feb.
Division of Physical Therapy Stanford U., Stanford (Palo Alto)	Wm. H. Northway, M.D. Lucille Daniels	Degree	4 yrs.	1–3–4	June and Sept. (Sr. yr.)
		Certif.	12 mos.	5	June and Sept.
COLORADO					
School of Physical Therapy School of Med., U. of Col. 4200 E. 9th Ave., Denver 7	Harold Dinken, M.D. Dorothy Hoag	Degree	4 yrs.	1	Sept.
		Certif.	12 mos.	2*–4–5	Sept.
CONNECTICUT					
School of Physical Therapy U. of Conn., Box U 101, Storrs	John C. Allen, M.D. Frances M. Tappan	Degree	4 yrs.	1–3–5–7	Sept. and Feb.
ILLINOIS					
Course in Physical Therapy Northwestern U. Med. School 303 E. Chicago Ave., Chicago 11	Emil D. W. Hauser, M.D. Elizabeth C. Wood	Degree	1 yr.	4	Oct.
		Certif.	12 mos.	2–4–6	Oct.
IOWA					
Dept. of Physical Therapy State U. of Iowa Univ. Hosp., Iowa City	W. D. Paul, M.D. Mrs. Olive C. Farr	Certif.	12 mos.	5	Sept.
KANSAS					
School of Physical Therapy U. of Kansas Med. Center 39th and Rainbow Blvd., Kansas City 12	Donald L. Rose, M.D. Mrs. Ruth G. Monteith	Degree	4 yrs.	1–7	Sept. and Feb.
		Certif.	12 mos.	2–4–5	Sept. and Feb.
LOUISIANA					
School of Physical Therapy Charity Hospital of La. 1532 Tulane Ave., New Orleans 12	Nathan H. Polmer, M.D. Sarah S. Rogers	Certif.	14 mos.	2–4	Sept.

Name and Location of School	Medical Director and Physical Therapy Director	Degree, Certificate or Diploma	Length of Course	Entrance Requirements	Classes Start
MASSACHUSETTS					
Dept. of Physical Therapy Boston U. Sargent Col. 6 Everett St., Cambridge 38 (Affil., School of Medicine)	Kenneth Christophe, M.D. Adelaide L. McGarrett	Degree Certif.	4 yrs. 12 Mos.	1-3-4-5-7 3-4-5-7	Sept. Sept.
‡ Course in Physical Therapy Bouve-Boston School Medford 55 (Affil., Tufts College)	Howard Moore, M.D. Constance K. Greene	Degree	4 yrs.	1-7	Sept.
‡ Program in Physical Therapy Simmons College The Fenway, Boston	{William T. Green, M.D} {Arthur L. Watkins, M.D.} Shirley M. Cogland	Degree Diploma	4½ yrs. 16 mos.	1-3 2*-4-5	Sept. Sept.
MICHIGAN					
Curriculum in Physical Therapy U. of Michigan 1313 E. Ann St., Ann Arbor	James W. Rae, Jr., M.D. Virginia Wilson	Degree Certif.	4 yrs. 12 mos.	1-7 2-4-5	Sept. June (Sr.yr.) June
MINNESOTA					
School of Physical Therapy Mayo Clinic 102-110 Second Ave., S.W., Rochester	Earl C. Elkins, M.D. Darrell D. Hunt	Certif.	2 yrs.	2-3-4-5	Sept.
Course in Physical Therapy Univ. Hosp., 204-TWH U. of Minn., Minneapolis 14	Frederic J. Kottke, M.D. Mrs. Ruby M. Overmann	Degree	4 yrs.	1-3	Sept.
MISSOURI					
Div. of Health and Hosp. Services St. Louis U., 1325 So. Grand Blvd. St. Louis 4 (Affil., Firmin Desloge Hosp.)	D. Elliott O'Reilly, M.D. Sister Mary Imelda, S.S.M.	Degree	4 yrs.	1-7	Sept. and Jan.
Dept. of Physical Therapy School of Med., Washington U. 660 South Kingshighway, St. Louis 10	Sedgwick Mead, M.D. Beatrice F. Schulz	Degree	4 yrs.	1-3	Sept.
NEW YORK					
School of Physical Therapy Albany Hospital New Scotland Ave., Albany 1 (Affil., Russell Sage Col.)	John W. Ghormley, M.D. Ann H. Downer	Degree Certif.	4 yrs. 12 mos.	1 2-4-5	Sept. Sept.
Courses for Phys. Therapists Columbia U., Col. of Physicians & Surg. 630 W. 168 St., New York 32	Wm. B. Snow, M.D. Mary E. Callahan	Degree Certif.	2 yrs. 12 mos.	3 2-5	Sept. Sept.
Physical Therapy Division School of Ed., New York U. Washington Square East, N.Y. 3	George G. Deaver, M.D. Elizabeth C. Addoms	Degree Certif.	4 yrs. 12 mos.	1 2*-4-5-7	Sept., Feb. and June Sept.
Program in Physical Therapy U. of Buffalo, 2183 Main St., Buffalo 14	Henry V. Morelewicz, M.D. Mildred Heap	Degree Certif.	4 yrs. 12 mos.	1-3-4 4-5	Sept. Sept.
NORTH CAROLINA					
Physical Therapy Course *School of Medicine, Duke U., Durham	Lenox D. Baker, M.D. Helen Kaiser	Certif.	15 Mos.	2*-4	Oct.
OHIO					
Course in Physical Therapy Frank E. Bunts Ed. Inst. Cleveland Clinic Hosp. 2020 E. 93rd St., Cleveland 6 (Affil., Bowling Green State U.)	Paul A. Nelson, M.D. Dorothy Spark	Degree Certif.	1 yr. 12 mos.	4 2-4	Oct. Oct.

Name and Location of School	Medical Director and Physical Therapy Director	Degree, Certificate or Diploma	Length of Course	Entrance Requirements	Classes Start
PENNSYLVANIA					
Div. of Physical Therapy School of Aux. Med. Services U. of Penn., 1818 Lombard St., Philadelphia 46	George M. Piersol, M.D. Dorothy E. Baethke	Degree	4 yrs.	1–7	Sept. and Feb.
		Certif.	12 mos.	5	Sept. and Feb.
The D. T. Watson School of Physiatrics, Sunny Hill, Leetsdale (Affil., U. of Pittsburgh, Sch. of Med.)	Jessie Wright, M.D. Kathryn Kelley	Diploma	12 mos.	2*–4	Oct.
TEXAS					
Grady Vaughn School of Physical Therapy Baylor U. Hospital, Gaston Ave., Dallas	Edw. M. Krusen, Jr., M.D. Peggy J. Dyer	Certif.	15 mos.	2–3–4–5–6	Sept.
Hermann School of Physical Therapy, Hermann Hosp. 1203 Ross Sterling Ave., Houston 5	Oscar O. Selke, Jr., M.D. Mrs. Elizabeth M. Barkley	Certif.	12 mos.	2–4–5	Oct.
Division of Physical Therapy, U. of Texas, Sch. of Medicine, Galveston	G. W. N. Eggers, M.D. Ruby Decker	Degree	12 mos.	4	Jan.
		Certif.	12 mos.	2–4–5	Jan.
VIRGINIA					
School of Physical Therapy Baruch Center of Phys. Med. and Rehab., Med. Col. of Va. 1203 E. Broad St., Richmond 19	Herbert W. Park, M.D. Susanne Hirt	Degree	2 yrs.	3	Sept.
		Certif.	12 mos.	4–5	Sept.
WISCONSIN					
Dept. of Physical Medicine Med. School, U. of Wisconsin Madison 6	Harry D. Bouman, M.D. Margaret A. Kohli	Degree	4 yrs.	1–3–4	Sept. and Feb.
		Certif.	12 mos.	2–4	Sept.
U. S. ARMY MEDICAL SERVICE					
‡Physical Therapy Course Med. Field Service School Brooke Army Med. Center Fort Sam Houston, Texas and Brooke, Letterman and Walter Reed Army Hospitals	John H. Kuitert, Lt. Col., M.C. Barbara Robertson, Major, WMSC	Certif.	12 mos.	5	Fall
Write to: The Surgeon General Department of the Army Washington 25, D.C. Att'n: Personnel Division					

Entrance Requirements:

1—Graduation from high school.
2—Graduation from accredited school of nursing.
3—Two years of college including certain specified courses.
4—Three years of college including certain specified courses.
5—Baccalaureate degree including certain specified courses.
6—Baccalaureate degree with major in physical education.
7—Students with advanced standing accepted.

Footnotes:

*—additional college science credits required.
‡ women students only.

Please direct all inquiries regarding tuition, entrance requirements and other specific information to the school and *not* to the American Physical Therapy Association.

Editorials

RECENTLY, in one of our large metropolitan cities, a meeting was held of primary concern to many groups dealing with patient care of a specialized nature. Included in these groups were members of our own profession as well as others of a closely allied nature all of whom were gathered as a result of a common interest in common problems. During the course of several of the sessions there appeared with rather noticeable regularity a pattern which was minor in so far as any direct application to the particular meeting was concerned but which assumes a major importance when its ramifications are considered in relation to our profession.

During several of the gatherings, numerous persons rose to speak and repeatedly identified themselves as "therapists." There was little if any effort made to clarify their identity, and no effort made on the part of the listeners to seek it. Several persons in positions to select, employ, and utilize these speakers continued this practice and spoke of their need, in terms of employing personnel, as a lack of "therapists."

We are deeply concerned with both the effect this may be producing in adding to an already existing confusion as well as what appears to be a lack of clear thinking on the part of professional people in meeting their responsibility to define their abilities and status.

For as long as we can remember, there has been a chronic complaint from individuals, chapters, educators, and committees dealing with all aspects of our field that, "people just don't know what physical therapy is." We have excused ourselves blandly by insisting that we are "a new profession," "not old enough," "still growing," and a score of other reasons. Perhaps if we honestly face our duties we can and will understand how such a small item as identifying our position by using "*physical* therapist" in every situation can improve our standing.

The importance of this identification is as necessary and as useful as the now accepted practice of wearing the APTA shoulder patch and, in many instances, will most certainly have equal or better results. A physical therapist when met in the environment of a working department, surrounded by all of the expected equipment, is easily recognized and is afforded to an ever growing extent an appreciation of his talents. But we cannot expect a similar situation to exist in other areas if, as individuals, we fail to provide this simple identification by referring to ourselves and our colleagues as *physical* therapists.

The rapid and expanding growth of auxiliary services to the medical profession has, understandably, led to a certain amount of confusion and lack of understanding in the ability of administrators, the general public, and those citizens directly concerned with patient welfare to correctly differentiate the talents and services available. As physical therapists we have a direct and constant responsibility both to them and to ourselves to lessen this confusion. We are a distinct and specific profession and must, in all instances, be constantly on guard to keep our identity clear and understood. It is only in such ways that we can assure the continued use of all of our services for the best possible result to the one most concerned — the patient.

Association Activities

Marriages

Alda L. Bevan of Chicago, Ill., now Mrs. Alda B. Kendell, LaGrange, Ill.

Ensign Pauline E. DesRochers of Philadelphia, Pa. to David K. Fauser, Philadelphia, Pa.

Lt. Dorothy McCarthy of Fort Dix, New Jersey, now Mrs. Dorothy M. Foegen, Fort Dix, New Jersey.

Mary K. Symonds of Sunderland, Mass., to John J. Aldrich, Sunderland, Mass.

Helen Antman of New York, N. Y., now Mrs. Helen A. Lawrence, Bronx, N. Y.

Ruth E. Jack of Downey, Calif., to Jerry B. Anderson, Downey, Calif.

Chapter News

Greater New York District

Plans for the Spring 1954 Educational Institute includes:

A. Two Workshops on Self-help Devices
B. Workshop on Problems of Muscle Testing — Goniometry
C. Workshop on Therapeutic Exercise and Kinesiology
D. Workshop on Posthetics Bracing
E. Symposium on Arthritis

Members have been requested to volunteer to assist in the workshop presentations.

Northern California

Two courses of instruction are being offered to Chapter members this winter.

I. Technic of Pool Therapy on six successive Tuesday evenings. This is an introduction to the theory of pool technics; intrinsic and extrinsic muscle action; conditions suitable for pool treatment; departmental administration and the construction and maintenance of pools; and practice in technics. The Instructor will be Lucy McDaniel.

II. Protective and Functional Devices on six successive Thursday evenings. To outline the general principles, purposes and current theories in relation to protective and functional devices; to demonstrate their uses and to provide practice in the construction of such devices. Instructors will be the Staff of the Physical Medicine Service, Letterman Army Hospital.

Southern California

From the November Newsletter

"Just in case you didn't know we have a KITTY or JACKPOT contribution. 25¢ payable as you enter the door. Proceeds — half to defray expenses of refreshments at meetings — other half to the member whose name is drawn. Every Chapter member's name is in the KITTY but *the catch is that you have to be present to collect!* To date we have $14.90 from the May meeting and $9.30 from October meeting — total $24.20 plus whatever is collected at November meeting will make a neat sum. Come to the November meeting as you may be the lucky winner."

Texas

Workshop on Assistive Devices

A day-and-a-half workshop on assistive devices for physical therapists and occupational therapists was held on January 30 and 31 at the Arabia Temple Crippled Children's Clinic, Houston, Texas.

The workshop leaders were Ed Snapp, physical therapist, and Charlotte Bone and Betty Larsen, occupational therapists.

Attention Physical Therapists

First Call for Abstracts of Papers
to be presented at the
Research and Clinical Studies Section
1954 A.P.T.A. CONFERENCE
to be held in
LOS ANGELES, CALIFORNIA
June 27th to July 2nd
Abstracts due April 15, 1954

SEE YOU ON THE

BLUE PACIFIC SHORE IN '54

Westward Ho!

When you come to the blue Pacific Shore in '54 and check in at the Los Angeles Statler on June 27 for your annual Conference, remember the password — "Aloha Nui Oe."

This greeting, a great big hello to you, keynotes the warm, open-hearted, truly western welcome that will be extended to you by the Southern California Chapter of American Physical Therapy Association.

Because the prevailing mood of the tropical Pacific Islands is one of such genuine hospitality and gay, relaxing fun, the Southern California Chapter hopes to be able to create a bit of mahana* Hawaiian atmosphere for you during Conference. Therefore the time has come to begin polishing up on your poi eating technic (three or two fingers most acceptable).

Remember in past years how you wished for more hours in the day because you couldn't begin to take in all the intriguing sights, interesting places and colorful locale of your conference city? Why not be prepared this year and plan your vacation so you can continue your fun beyond Conference?

Besides the wealth of entertainment offered by our nation's fourth largest metropolis, bear in mind that all of Southern California is an oversize playground. Whatever your interests—carefree play or studious research—you may enjoy them all if you have the time.

In Los Angeles one of the oldest and most fascinating attractions is Angel's Flight, the shortest railroad in the world, where you can holoholo for five cents round trip.

The world's richest collection of prehistoric remains was found in the La Brea Tar Pits, where admission is free to view these relics of an ancient age.

No visitor to Los Angeles should miss a visit to the unique and colorful Farmers Market. It is doubtful that you could ask for anything that they couldn't find for you. For other quaint shops and eating places there is Chinatown, and on Olvera Street north of the old Plaza, you will find a bit of old Mexico with its curio shops and cafes.

Facing the Plaza, which was the beginning of modern Los Angeles, is the Old Mission Church, still the center of an active parish, which contains fine old statuary and stained glass windows. For those eager to learn more of the history of the Golden State a pilgrimage to the many old missions along El Camino Real is a must and the many museums of history, science and art can hold one enthralled for days. And isn't there always someone who just has to visit the Zoo? Within easy range of Los Angeles is an Alligator Farm, an Ostrich Farm, a Lion Farm, a Chinchilla Farm, an Arabian Horse Farm, and a Tropical Bird Park as well as a regulation Zoo.

Besides the Zoo in picturesque Griffith Park you will find the Planetarium and the Greek Theater, where a ten week season of light opera is presented from June to August.

Haven't you always dreamed of spending at least one evening under the stars in the world's most beautiful amphitheater, the Hollywood Bowl? Or would you prefer the Padua Hills

*Note: See next issue for glossary of unfamiliar words.

Wilshire Boulevard, crossing MacArthur Park with downtown Los Angeles in the background.

Theater where plays of old California are presented by all-Mexican casts?

Perhaps you are a sports fan. If so, you may find your way to Wrigley Field or Hollywood Baseball Park. Or if you are a lover of horse racing there are fifty days of racing at Hollywood Park from May to July.

But, perchance, all you crave is an opportunity to practice that relaxation you have been preaching all year. So you may have a choice of ocean beaches, mountain lakes, or desert ranches.

At any rate, hele mai makai and mauka prepared for a wonderful, gay and carefree playtime when the serious Conference hana is pau.

Student Section

Student News

Hi, Students — We're back again with more news of what's happening across the nation. We have enjoyed all your letters, and we hope they will keep coming. Most of our mail seems to come from west of the Mississippi though; so let's have more from the east coast.

• We hear from Mrs. Virginia Edmondson at Houston, Texas that the students at Hermann Hospital have launched a recruitment program consisting of posters in the hometown high schools, personal appearances and the recruitment film, "Within Your Hands." This is certainly a worthy project.

• Rosella McCarthy, at St. Louis University, reports a raffle (on a portable radio) to raise money for a physical therapy library. She also reports plans for a school picnic, a party for the senior class and an Open House.

• From the Medical College of Virginia comes news of a party, given for the pediatric department and the polio respirator ward. It was a huge success from the children's point of view, and I'm sure the "future P. T.'s" also enjoyed themselves. They also report that the students are taking an active interest in the Virginia chapter A. P. T. A. meetings.

• The University of Wisconsin asks: "Did you have the feeling when you were a student in

physical therapy that you were not quite sure about what you were getting into?" The Student Physical Therapy Club at the University of Wisconsin has solved this problem for many of the students in P. T.

The Physical Therapy Club, which has approximately seventy-five members, holds monthly meetings. For the November meeting, the staff presented a program entitled "The Day in the Life of a Physical Therapist." As student-patients received treatments, the technics and equipment were explained by the student physical therapist.

Beside giving the lower classmen a chance to see clinical work, the club accomplishes many other things. Opportunities in physical therapy are presented, upper and lower classmen become better acquainted, students and faculty have a chance to know each other on a basis other than in the classroom.

The Physical Therapy Club helps build enthusiasm for the profession and the student has a chance to see many interesting aspects of physical therapy.

Thanks to Mary Marlin for this bit of news.

• The following article came to us from Marion Kroupa of the University of Southern California:

Physical Therapy Student Library

When an evaluation was made last fall of the existing library facilities, it was found that while the necessary reference books were available in the medical library, the physical therapy staff had been contributing their own texts and *Physical Therapy Reviews* for more convenient use by the students.

It was decided therefore to correct this situation and at the same time make desirable books accessible to the students.

First a permanent librarian was appointed with each student alternating weekly to assist her. A cross-index file was set up by title, by author, and by student. The student's card includes his 'phone number so that he may be contacted when others desire a book which he has.

It was then agreed that each student would contribute a book on Physical Therapy or an allied field to be used by the students for the year. At the end of this time the book reverts back to the original owner if he so desires. In the meantime he may withdraw his own books under the same stipulations that apply to all the reserved books.

At present we are considering student activities to raise funds to replace texts loaned by the staff to be left in the library as a permanent contribution. In this manner we hope to initiate a Physical Therapy Library that in time will grow into a complete reference library from which future students will acquire a broad fund of information conveniently.

She also reports that they are off to a good start at minimal cost, thanks to a recent auction of a doctor's possessions.

I guess that's all for this issue except don't forget to keep those letters coming.

School News

New Student Members

University of Southern California

Rulon S. Francis
Diana H. Gray
Austine F. Grigsby
Mahlon Hamann
Robert Eugene Hughes
Marion Kroupa
Kathleen McNally
Edith Marie Short

Children's Hospital Society

Donna-Jane Blake
Max O. Grunig
Francine V. Kellerman
Luther A. Keyes
Wayne E. Kirker
Janice M. Kraemer
Juanita P. Lee
Eleanor B. LeVine
Grace Mayemura
Carol McManigal
Caroline E. Rice
Lila W. Swanson
Edward Woudenberg
Marilyn J. Wynn

Stanford University

Charles H. Carter
Glenn McClellan Darnall
Daniel Dexter
Anne Evans
Martha J. Fortune
Marguerite Gandiaga
Joyce Gillette
Oystein Holter
Joy Johnson
Carole McNeill
Mary Lou Ratcliff

University of Connecticut

Alice Blowen
Donna Marie Cummings
Jannett Clair Felie
Mary Jane Madden
Gail Lois McCann
Constance Ann Northrup
Beth Jean Raphael
Eleanor Rembisz
Maija Sturans
Nancy M. Wakeman
Meredith Louisa Wardell
Carol Jean Wennrich
Harriet Yale

Columbia University

LaNoel Brazil
Margaret J. Budd
David Harkins
Judith Haverstock
Anne Stilwell

Duke University

Sue Carter
Betty McCoy
Geraldine Creaghe
Bon Nel Jones DeMers
Jennie Harris
Doris James
Idell Landrum
Michael Myers
Duane Pepiot
Joy Smith
Martha Jane Trotter
Arlene Walker

University of Iowa

Norman Britt
Duane Chase
Wayne Cummings
Wilford Emmons
Keith Fitzpatrick
Raymond Hatate
Barbara Kippen
Vincent Masin
James May
Allan Quail
Eugene Rembe
Donald Rockwell
Unis Saylor
Joseph A. Szuhay
Paul Williams

Bouve-Boston School

Dorothy Brownell

University of Minnesota

Maryanna Baker
Joyce Coffman

St. Louis University

Rosella M. Allen
Sister Mary Armella Bartosik
Harry H. Barnett
Sister Mary David Blackburn
John J. Biscan
Joan Bodner
Mary A. Condon
Sister Marciana Heimann
Sister Mary Regina Hoff
Patricia Holland
Patricia C. Kinsella
Sue Kirby
Sister M. Joanette Kleffner
Phyllis M. Kurt
Ruth U. Mitchell
Alvin S. Ohta
Harriet Wehlermann

University of Buffalo

Barbara Ann Stevenson

University of Pennsylvania

Nancy J. Barlow
Margery J. Coale
Donald A. Sakson
Louise A. Varney

University of Wisconsin

Edith Marie Borchardt
Raymond Cooper
Jean Gayle Heath
Robert J. Hutchinson
Charles Kienzle
Mary R. Moore
Richard Oehler
Jean Elizabeth Pelton
Joan Werner

U.S. Army, MFSS

Janet Blomgren
Ann Bogrette
Ann Broad
Beverly Brown
Carol Daly
Barbara Ducharme
Jane Gale
Wanda Hand
Lois Hartranft
Genevieve Killins
Beverly Kozlow
Mary McNeill
Virginia Metcalf
Betty Mullen
Margaret Norstedt
Frances Parks
Mary Schrader
Emma Shaffer
Hazel Steiner
Bobbie Strickland
Marian Thompson
Florence Wambach

Recruitment Filmstrip in Color

The physical therapy recruitment color filmstrip, "Physical Therapy, A Career of Science and Service," is now ready for distribution. Written by Lorraine Lake, Chairman of the Education and Recruitment Committee, and produced by Popular Science Visual Aid Department, the 50-frame filmstrip is an invaluable aid in helping to interpret physical therapy to the lay audience.

The first few frames capture the interest of teen-age viewers with the story of a young football player who has fractured his leg. His visits to the physical therapy department not only help speed him back to the line-up, but they also serve to interest his girl friend in the possibilities of a career in this area of medical specialization. Ensuing frames illustrate many types of patients and their treatment.

The final portion shows the education that a physical therapist must have, and finally the types of positions that are available to the fully qualified physical therapist.

Most of the pictures in the strip were taken at Barnes Hospital in St. Louis. Accompanying the filmstrip is a manual with carefully written suggestions for using the filmstrip to best advantage in both science classes and vocational guidance sessions.

The filmstrip is highly recommended to every APTA chapter and school of physical therapy as a very useful aid in the recruitment program. While the strip is produced primarily for showing to prospective students, it is equally useful in interpreting the profession to adult lay groups.

Popular Science is listing the filmstrip in its catalog which goes to secondary schools throughout the country. While the catalog list price is $6.00, APTA chapters and districts, and schools of physical therapy may purchase the filmstrip from the American Physical Association, 1790 Broadway, New York, N. Y., for $4.50 per print. A utilization manual accompanies each filmstrip.

Medical College of Virginia
Baruch Center of Physical Medicine and Rehabilitation

In 1944, Mr. Bernard Baruch made a grant to the Medical College of Virginia to establish a research and teaching center in memory of his father, Dr. Simon Baruch. Doctor Baruch was graduated from the Medical College of Virginia in 1862; was professor of hydrotherapy at the College of Physicians and Surgeons at Columbia University; and became known in this country as the leading exponent of hydrotherapy.

The Baruch Center was established with three areas of development in view, namely, research, education in physical medicine with special emphasis on spa therapy and climatology. With outstanding leadership, ability, and untiring efforts, Dr. Frances A. Hellebrandt made many of Mr. Baruch's dreams come true.

The school of physical therapy opened its doors in September 1945, with an enrollment of 40 students. The center, since that time, has become an integral part of the Hospital Division and the school of physical therapy, a division of the medical school. The Medical College of Virginia is unique. It is not only one of the largest medical centers in the South but is composed of the largest number of medical and para-medical training facilities in this country. It offers training for physicians, dentists, pharmacists, nurses, medical technologists, dieticians, hospital administrators, x-ray technicians, practical nurses, occupational and physical therapists.

The school of physical therapy has had an enrollment of 40 to 50 students a year, with approximately 50 per cent male students, and can now look back on a group of 320 qualified alumni who came to it from more than forty states and several foreign countries. Up to the present date the school offers a 12 month certificate course to students, who have obtained either a bachelor's degree, or who have completed three years of college work. The school is affiliated with the Richmond Professional Institute of the College of William and Mary which offers a degree to students satisfying its requirements. Plans are in the making for establishing a two-year program, based upon two years of college in an approved school offering the nationally required prerequisite courses for physical therapy training. After completing the two-year professional curriculum, the students will be granted a bachelor of science degree from the Medical College of Virginia. A 12 month certificate course will be continued as long as the need exists. The student entering the

Medical College of Virginia enjoys its many privileges and advantages. The close association with medical and para-medical professions affords an opportunity to hear lecturers of the highest calibre in all medical and para-medical aspects. Dr. Herbert W. Park, Medical Director of the Baruch Center, and two additional physicians are available for student training both in academic and clinical subjects. Laboratories of the medical school are available to physical therapy students; these include a fully equipped anatomy laboratory with facilities for dissection. All basic science courses are taught by staff members closely associated with the department, who appreciate the specific needs and interests of the physical therapist. Ample laboratory space is available for all technical courses.

The school of physical therapy is located in Memorial Hall. This building is being converted gradually to a center exclusively for physical medicine and rehabilitation. Wards are available for long-term patients both children and adults, white and Negro patients, requiring physical therapy treatments. A speech clinic sponsored by the Junior League and a hearing clinic under the department of otolaryngology, have been added recently to the Memorial Hall facilities. Dr. William T. Sanger, president of the Medical College of Virginia and at present president of the National Society for Crippled Children and Adults, has demonstrated an unusually keen interest in the development of a center for total rehabilitation of the disabled.

Clinical physical therapy facilities are available not only in the hospital units of the college but also in Memorial Hall. Students have opportunities to observe patients' treatments during their first weeks in school and to follow their progress throughout their stay. During three of the summer months, students are assigned to uninterrupted clinical practice periods. All facilities of the college are utilized, and in addition, training is offered at the Woodrow Wilson Rehabilitation Center, Fishersville, Virginia, one of the most complete vocational rehabilitation centers of its kind. Other affiliating institutions are McGuire Veterans Administration Hospital, Richmond, Virginia; Mt. Alto Veterans Administration Hospital, Washington, D. C.; George Washington University Hospital, Washington, D. C.; The District of Columbia Municipal Hospital, Washington, D. C.; and many other centers throughout the southeastern section of the country. The college has a graduate school offering training for qualified students in physical therapy.

Although the Medical College is a professional school and has a student body of over 1,500, it has many of the characteristics of a university campus. There is ample opportunity for both social and professional relationships among the student bodies of various schools. There are intramural and varsity basketball and baseball teams, both for men and women, and regular student body dances sponsored by the various schools. Physical therapy students are an integral part of the student body and are represented in the student government of the college.

Richmond is beautiful and historic. It has been a center of medical education for more than a century. It is located in the heart of the first permanent English civilization planted in America. Richmond, well known for its museums, libraries, monuments, historic public buildings, homes, and churches, offers many opportunities for students to enjoy a cultural atmosphere, which is particularly significant for those preparing for the health-service professions.

General News

Kessler Institute's New Treatment Building Dedicated

The dedication ceremonies of the new treatment building of the Kessler Institute for Rehabilitation took place on Sunday, December 6. The ceremonies included talks by several prominent persons.

The chief speaker was H. E. Madame Vijaya Lakshmi Pandit, Madame Pandit is President of the United Nations General Assembly, a member of the Parliament of India, and chairman of the Indian delegation to the United Nations.

The new treatment building will make possible expansion of the institute's program from a 33-bed center to a 48-bed center. In addition, the outpatient capacity of the institute will be doubled. The new unit will house departments of occupational therapy, speech therapy, and physical therapy. The speech therapy department is a gift of the Evening Membership Department of the New Jersey Federation of Women's Clubs. The building will also house the Fred H. Albee Memorial Library and the Ross-Rosenbaum Dental Clinic. Executive officers and other patient facilities will also be included.

The present physical therapy ward in the old building will now become an additional nursing ward. The occupational therapy department will become a patients' dining room. Expansion of the institute was made possible by generous gifts

from foundations and friends of the institute. Mr. Joel L. Schlosinger, Treasurer of the Board of Trustees, was chairman of the new building project.

The Kessler Institute for Rehabilitation was founded in 1949 as a voluntary, nonprofit center for the rehabilitation of handicapped men, women and children regardless of race, creed, color or economic status.

The Albert Lasker Awards for Distinguished Services to the Physically Disabled

Purpose:

The purpose of the Awards is to emphasize, through recognition of distinguished accomplishments, the importance of developing services for the physically disabled and of international cooperation in making such services available to the largest possible number of the world's disabled.

Awards:

The Albert and Mary Lasker Foundation will provide three Awards to be presented each third year, beginning in 1954, to persons or groups whose accomplishments have been of international significance in the development of services for the physically disabled. A silver statuette of the Winged Victory of Samothrace, together with a prize of $500, will accompany each Award.

Selection:

Nominations will be invited from the affiliated national organizations of the International Society for the Welfare of Cripples and from other selected organizations having special competence in this field. An international panel of experts, appointed by the International Society for the Welfare of Cripples, will select three recipients from among the nominees. Dr. Gudmund Harlem, chairman of the Royal Commission for the Study of Rehabilitation Services, Oslo, Norway, will be chairman of the Lasker Awards Committee.

Presentation:

The first Awards will be presented at The Hague, Netherlands, on September 15, 1954 in connection with the Sixth World Congress of the International Society for the Welfare of Cripples. Subsequent presentations will be made at the World Congresses of the ISWC, which are held each third year.

The Albert and Mary Lasker Foundation was established in 1942 for philanthropic purposes in the field of medicine, public health and other areas of human welfare. In 1944, the first Lasker Awards were given to honor and encourage physicians and scientists for important contributions in the fight against disease. Since 1944, annual Awards of the Winged Victory statuettes, together with monetary prizes, have been made to doctors, scientists and public health officials for signal achievement in the fields of mental health, public health administration, medical research and planned parenthood.

The continued purpose of the Awards is not only to honor the recipients and dramatize their accomplishments, but also to create increased professional and public interest in these achievements. In the eight years since their founding, the Lasker Awards have come to be regarded among the nation's primary medical honors. Seven of the scientist winners have already received Nobel Prizes.

The International Society for the Welfare of Cripples is a federation of national voluntary organizations conducting programs for physically handicapped children and adults. Its present membership includes organizations in twenty-six countries and its services are provided to persons and organizations throughout the world interested in the problems of physical disability.

Columbia Postgraduate Cerebral Palsy Course

March 29 to May 28, 1954

This is a comprehensive course for qualified occupational therapists and physical therapists with some working experience. The cerebral palsy field is first surveyed in lectures, demonstrations, and discussions; psycho-social aspects are included as well as the medical, with intensive review of neurology.

Approximately twenty days are spent in clinical affiliations. Included are inpatient, outpatient, and school clinics, and physical and vocational rehabilitation centers. Seminars are designed to correlate the student's knowledge.

The over-all aim is to encourage accurate observation and critical thinking in this controversial field.

This course is sponsored by United Cerebral Palsy Associations, Inc., and the Coordinating Council for Cerebral Palsy in New York City, Inc.

For further information write Office of the Dean, College of Physicians and Surgeons, 630 West 168th Street, New York 32, N. Y.

Course Offered in Polio Patient Care

Orthopaedic Hospital, Los Angeles, and Rancho Los Amigos Respiratory Center for Poliomyelitis, announce a five-day course in polio, April 25-30, 1954, aided by a grant from the National Foundation for Infantile Paralysis, for physicians, nurses, therapists and social workers.

The course is open to physical therapists who are graduates of schools approved by the Council on Medical Education and Hospitals of the American Medical Association. It is designed to present all phases of patient care and rehabilitation including opportunity for ward experience with respirator patients and equipment at the Rancho Los Amigos Hospital. Coordination of services will be stressed.

Address all inquiries to: Polio Teaching Program, Orthopaedic Hospital, 2400 S. Flower Street, Los Angeles 7.

A New Publication on Multiple Sclerosis

Many thousands of persons suffer from multiple sclerosis. A progressive disorder of the nervous system, it inevitably results in complete disability. Because it primarily strikes those between the ages of 20 and 40 and frequently does not terminate until the conclusion of the average life span, multiple sclerosis constitutes a long-term burden to the patient and family.

A pamphlet, produced by the National Multiple Sclerosis Society in cooperation with the National Institute of Neurological Diseases and Blindness, is the first designed for consumption primarily by the victim of multiple sclerosis. A realistic presentation of the medical status of the disorder and the facilities available for its amelioration, it may aid the multiple sclerosis patient to adapt to his condition. It is also hoped that this publication will prove of interest to those associated with the problems of multiple sclerosis and who are in a position, professionally or nonprofessionally, to help do something about them.

The National Multiple Sclerosis Society and the National Institute of Neurological Diseases and Blindness are distributing the pamphlet with these purposes in mind. Those who receive it are asked to cooperate wherever possible by bringing it to the attention of the multiple sclerosis patient and his family, to health educators, social workers, nurses, and others for whom this disorder may be of deep concern. Copies of the pamphlet may be obtained in limited quantities by writing to the Public Inquiries Branch, Public Health Service, Department of Health, Education, and Welfare, Washington 25, D.C.

Cerebral Palsy Academy Announces New Officers

At the last meeting of the American Academy for Cerebral Palsy, held in Fort Worth, Texas, October 30-31, 1953, the following officers were elected:

Meyer A. Perlstein, M.D. ..... *President*
Lenox D. Baker, M.D. ..... *President-Elect*
Harry E. Barnett, M.D. ..... *Secretary-Treasurer*

Index to Current Literature

Some Unsolved Problems of the Scientific Career. Lawrence S. Kubie, Am. Scientist, 41:596-613, October 1953.

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Familial Early Infantile Myasthenia Gravis. B. Bornstein, Acta paediat. 42:442-447, September 1953.

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Abstracts

Current Needs for Research in the Obstetrical Factors in Cerebral Palsy

George Anderson, CEREBRAL PALSY REVIEW, 14:3-8, October, 1953.

This article presents the problems, the present needs and the status of the obstetricians in contributing to the etiology of the syndrome of cerebral palsy.

Some of the reasons discussed for the very few contributions by the obstetricians have been attributed to primary concentration in reducing maternal mortality; the increasing number of babies delivered with the simultaneous decrease in personnel, making it imperative to denote efforts to medical care with little time for research on problems such as cerebral palsy; lack of records and actual case finding for studies.

In addition, the author feels that the role of obstetrical factors in the etiology of cerebral palsy is not definitely established. In previous studies the birth processes have been suggested as a factor in 5 to 50 per cent of the cases. This discrepancy should encourage investigation and research in obstetric clinics.

Among the factors which appear to have significance are premature birth, antepartum hemorrhage, specific maternal diseases, mechanical procedures such as forceps rotation of the posterior vertex presentations, kernicterus, and the condition of the child at birth.

The author suggests the following program to create more interest amongst obstetricians to meet this problem:

(1) Inclusion of the place of birth on the records of cerebral palsy cases registered with agencies.

(2) Yearly reports from agencies on the existence of new cases.

(3) Additions to the prenatal records to include questions regarding antepartum hemorrhage, nutrition, diseases such as measles and fetal movements.

(4) Financial support for the investigation of premature onset of labor.

(5) Investigation of causes of antepartum hemorrhage.

(6) Encouragement of obstetricians and others in the study of reproduction pathology and physiology.

Motor Units and Fibrillation Potentials as Recorded with Different Kinds of Needle Electrodes

Arne Lundervold and Choh-Luh Li, ACTA PSYCHIATRICA ET NEUROL. SCANDINAV. 28: 201-212, 1953.

This study was undertaken to compare the findings of various types of needle electrodes utilized in electromyography. The authors point out the shortcomings of skin electrodes in order to obtain direct registration of the action potentials from single muscle fibers or motor units.

Normal and denervated human muscles were used for all experiments. The measurements of the three different types of needle electrodes were given and the active electrodes were connected to the grids of a balanced push-pull amplifier with a time constant of 0.45 and balance ratio 5000/1, then a Cathode-Ray Oscilloscope and loud speaker. The findings were recorded photographically.

A motor unit and fibrillation potential was examined by various combinations of electrode leads from the concentric needle in the following manner: 1) monopolar, 2) concentric, 3) real double core concentric and back again to 4) monopolar, 5) concentric, and 6) real double core needle electrode in the biceps muscle. This procedure was repeated in the abductor digiti quinti, extensor carpi radiale and triceps muscles. A fibrillation potential from a denervated facial muscle was recorded in the same manner. The appearance of the spike from the same combination of leads in successive series was identical.

The amplitudes, duration and form of the spike potentials were clearly tabulated for comparison of the different types of recording electrodes.

A discussion of the electrical features of a fibrillation potential and motor unit discharge pointed out the following differences:

(1) A single fiber discharge is most accurately recorded by the monopolar needle technic.

(2) The concentric needle recording depends upon orientation of the needle in reference to the long axis of the muscle fiber. This determines the form of the spike and amplitude and duration.

(3) The electrical field created by a motor-unit discharge is relatively large and the size of the discharge is dependent upon the number of fibers participating.

(4) Because of the anatomical structure of muscle bundles and the intermingling of terminal fibers, an isolation of the discrete potential field is impossible.

(5) Thus a single discrete unit discharge probably represents the maximum potential created by a motor unit dominating the zone where the electrode is placed.

Reproductions of photographs are offered to substantiate the above.

In summary, the authors believe that in order to obtain the maximum amplitude of a given action potential and to avoid directional properties determined by the orientation of a coaxial needle, the use of a monopolar electrode is most desirable. This is especially true in studying the fibrillation potential. However, either the single core or double core concentric needle is best for the analysis of polyphasic units.

Interstitial Pneumonia and Focal Myocarditis in Poliomyelitis

S. S. Jurow, and V. B. Dolgopol, AM. J. MED. SCI. 226:393, October, 1953.

Complete necropsies on 140 cases of poliomyelitis has served as the basis for this paper. Only cases where death occurred during the early acute stages were used.

The criteria used for the diagnosis of interstitial pneumonia were a predominant lymphocytic infiltration of the bronchial mucosa and the absence of polymorphonuclears in the bronchial lumen. Peribronchial tissues showed an infiltration of lymphocytes and plasma cells, heaviest in the walls nearest the bronchi and gradually diminished in severity in more distant alveoli. Areas of atelectasis were not considered inflammatory. This microscopic evidence of some form of pneumonia was found in 62 of 121 cases, an incidence of 51 per cent. Interstitial pneumonia was found in 31 cases or 25.6 per cent in one or more lobes. It was the only pneumonic lesion found in 18 cases.

Acute focal myocarditis was found in 73 cases of poliomyelitis (32.9 per cent) in which multiple sections of myocardium were available. The largest number of cases of myocarditis was seen in patients who died between the third and fifth day after the onset of the disease.

Further work needs to be done to definitely establish the viral etiology of interstitial pneumonia in poliomyelitis. The possibility that such pneumonia may be due to the aspiration of regurgitated gastric contents is discussed.

Cardiovascular Effects of Raised Airway Pressure

H. Bjurstedt, Earl H. Wood and A. Åström, ACTA PHYSIOL. SCANDINAV., 29 (Fasc. 2-3): 190-201, October, 1953.

The influence on the systemic arterial pressure of increased airway pressure in anesthetized dogs has been studied during (1) positive pressure inflation of the lungs, (2) simultaneous positive pressure inflation of the lungs and the intraperitoneal cavity, and (3) positive pressure inflation of the abdomen with occlusion of the trachea.

The effects have been analyzed and compared with the arterial pressure response obtained in a "passive" Valsalva experiment in conscious man and also with the cardiovascular effects in the classical Valsalva experiment.

In the experiments (2) and (3) the response of the arterial pressure was similar to that in the classic Valsalva experiment, i.e., an initial rise of arterial pressure was observed. Positive pressure inflation of the lungs in dogs under sodium pentobarbital anesthesia (1) produced a fall in the arterial pressure qualitatively comparable to that seen in the "passive" Valsalva experiment performed in the unanesthetized human subject.

The role of the intra-abdominal pressure for the arterial pressure response has been further illustrated. Some possible practical situations on which these observations may have some bearing have been briefly discussed.

Stress and Capillary Resistance (Capillary Fragility)

Jenö Kramár, AM. J. PHYSIOL., 175: 69-74, October 1953.

Forced muscular exercise or exposure to cold stress elicits a typical response in the capillary resistance of the albino rat. Four phases were distinguished in this response: initial rise, critical drop, a period of abnormally low resistance, restoration to normal. The second and third phases may be termed "capillary crisis." As in the author's earlier work the same response was found following sham adrenalectomy or ether anesthesia and according to recent observations emotional stress may also be followed by a similar change in the capillary resistance, it is believed that the described phenomenon represents a further, hitherto unknown, manifestation of the nonspecific stress syndrome.

While, in general, the described capillary response was rather uniform, there were variations in the details (time element, quantitative aspect). Five patterns could be distinguished on this basis; average, accelerated (telescoped), rudimentary, protracted, refractory. Whereas the type of stress has no shaping influence on the capillary response, the intensity of the stress, previous diet, training, and individual characteristics of the animal may be strongly contributory.

In view of our recent knowledge of the endocrine regulation of the capillary resistance an attempt was made to elucidate the mechanism and significance of the described capillary response to stress. While the initial rise in the capillary resistance is likely to be due to an increased elaboration of cortisone elicited by ACTH discharge, the capillary crisis appears to be the result of a decrease in the adrenocortical activity not related primarily to the anterior pituitary. DCA seems to play no apparent role in this capillary response.

Corrective Brace for the Upper Extremity in Hemiplegia

L. N. Rudin, D. Cronin, and J. Croucher, J.A.M.A. 153:5, October 3, 1953, p. 479.

This article reports on an upper extremity brace which has been developed to overcome the contractures of hemiplegia as quickly as possible. The main features of the brace are a series of springs at the elbow, wrist, finger and thumb joints which act in an opposite direction to the pull of the contractures.

The principle of the brace is that the constant tension produced by the springs gradually overcomes the contractures. The brace is such that it may be removed for physical therapy procedures but can be worn at all other times. The authors advocate pulley exercises to overcome abduction contractures.

The Effects of Exercises and Smoking in the Electrocardiograms and Ballistocardiograms of Normal Subjects and Patients with Coronary Artery Disease

F. W. Davis, W. R. Scarborough, R. E. Mason, M. L. Singlewald, and B. M. Baker, AMERICAN HEART JOURNAL, 45: 529-524, October 1953.

The purpose of this report was to describe the results of preliminary studies of the ballistocardiographic and electrocardiographic responses to exercise and cigarette smoking. This study was done in an attempt to extend the clinical value of the ballistocardiograph by employing "stress-eliciting" procedures to further distinguish the clinically normal person from the patient with angina pectoris and/or mycardial infarction.

Both the exercise and smoking groups contained 200 subjects. Each subject was studied after a 15 to 20 minute rest. For exercise the two-step test was employed using the Master tables for quantitation of the exercise. After exercise was completed, electrocardiograms were obtained immediately, in 3 and 5 minutes. Ballistocardiograms were obtained 1, 4, 6, and 10 minutes after completion of steps. Cigarette tests consisted of obtaining a control ballistocardiogram, electrocardiogram and blood pressure readings, and then subjects smoked a cigarette. Repeat readings were obtained immediately after the completion of the smoking.

The ballistocardiographic exercise test was considered positive if a normal record became abnormal or an already abnormal one became more so.

The results of the study showed that the ballistocardiograms in 7.9 per cent of normal control subjects and in 31.4 per cent of patients with coronary artery disease deteriorated after exercise. The ballistocardiograms in 6.8 per cent of normal control subjects and in 58.6 per cent patients with coronary artery disease deteriorated after smoking a cigarette.

Conclusions drawn from the study indicated that the diagnostic value of the ballistocardiographic two-step test is limited and the differences found are too small to be of importance in diagnosis. Of all objective tests used the ballistocardiographic cigarette test served best to distinguish patients with control subjects.

The authors hoped this study would encourage further investigation of the effects of smoking and nicotine on the cardiovascular functions as determined by the ballistocardiograms.

Essential Precautions in the Treatment of New Phenomena in Multiple Sclerosis

R. Brickner, Arch. Neurol. & Psych. 70:483; October, 1953.

This paper is a discussion of the precautions necessary in the treatment of multiple sclerosis by the use of vasodilation. The method appears to be effective but the type of medication, dosage, and frequency of administration often vary with each patient and at different stages in each patient's course.

The fact that vasodilation would reduce new symptoms recurring after a remission has long been known. The duration of relief after a single vasodilation has not been known. It is now known, however, that with carefully timed repetitions of drug administration the improvement may be lasting.

Two methods of inducing the vasodilation are discussed. Histamine phosphate by iontophoresis and amyl nitrite by wiffing are the most effective known procedures. The former acts very slowly while the amyl nitrite affects the blood vessels very swiftly.

If the involvement of the CNS is already massive the initial effect may be a transient adverse effect, thus in any patient with advanced involvement great care must be exercised. Even 3 wiffs of amyl nitrite may be unsafe. A good precaution against transient regression is to have the patient prone throughout the procedure and for a time thereafter. Amyl nitrite is the drug of choice where it can be tolerated with effectiveness. Continuous observation is necessary, however, because the drug may do no harm at one time while causing a transient regression at another. Carbon dioxide is being tried in experimental cases. Case reports are included which illustrate relief of symptoms by the vasodilation technic as well as cases illustrating transient regression during therapy.

Studies on Headache, Evidence of Tissue Damage and Changes in Pain Sensitivity in Subjects with Vascular Headaches of the Migraine Type. Harold G. Wolff, M. Martin Tunis, and Helen Goodell, ARCH. INT. MED., 92:478-484, October 1953.

During the examination of a large group of persons experiencing vascular headache of the migraine type, spontaneous hematomas in the temporal and preauricular regions in 11 subjects were observed, providing evidence of gross tissue injury in the area of headache. Repeated observations on a series of 19 subjects with headache, who did not have hematoma at the time, revealed that lowered deep pain threshold about the extracranial arteries and adjacent tissues was an invariable accompaniment of the headache. Neither lowered threshold alone nor moderate vasodilatation, per se, caused headache, yet alteration in the contractile state of the cranial arteries was an essential requirement. Further, those persons subject to vascular headache exhibited a heightened variability in the contractile state of specific portions of the cranial vascular tree, which was especially notable during periods of frequent attacks. At such times, after a period of conspicuous variability in contractile state of cranial arteries, there followed a phase of vasoconstriction succeeded by dilatation, intramural vascular edema, and lowered pain threshold. Under these circumstances vasodilatation becomes painful and the headache attack ensues.

Course and Management of Myasthenia Gravis

D. Grob, J.A.M.A. 153:6, October 10, 1953.

A group of 202 patients with generalized myasthenia gravis were studied and statistically revealed the following: Thirty-two per cent died within an average of 6 years after onset; 13 per cent are in complete or near complete remission; 25 per cent improved to a moderate degree; 20 per cent remained unchanged; 10 per cent have become worse. One fourth of the patients have had complete or near complete remissions of their disease at some time during their course, with the average length of remission being 4.6 years. Sixty-one per cent of the cases were women. The onset of the disease was at a lower age group in women, whose average age was 28, than in men whose average age was 43 at onset. Of 27 patients in whom the disease began before the age of 17, 23 were women.

The course of patients who underwent thymectomies or who were subjected to thymus irradiation was in general only slightly better than the course of patients who had neither procedure performed. Fifteen patients had a thymoma; of these 10 had a rapid fulminating course ending in death regardless of whether thymectomy was performed.

When localized ocular myasthenia gravis became generalized, it usually did so within one year after onset. Those who had the localized symptom for more than one year did not have further extension of the disease.

The maximal strength attainable with tetraethylpyrophosphate (TEPP), octamethyl pyrophosphoramide (OMPA), or neostigmine bromide, or with their combination has been approximately the same. TEEP and OMPA seem to provide more sustained strength and endurance in most patients.

Decubitus Ulcers Treated With Dried Blood Plasma

A. B. Clark, and H. A. Rusk, J.A.M.A. 153: 787, October 31, 1953.

A specific cause for decubitus ulcers has not been established. One study points to mechanical factors as being the primary cause. Malnutrition has long been known to be a deterrent to healing. Thus, assuming that ischemia and consequently poor nutrition to the part are major contributing factors in the formation of decubiti, it is logical to expose the cells to as natural a nutritional environment as possible in order to facilitate healing. This is the rationale behind dried plasma therapy.

The present study was conducted over a period of 14 months on 11 patients with spinal cord injuries. The decubiti were treated with a paste containing dried blood plasma in a vehicle of Peruvian balsam. Results were evaluated on a basis of scar tissue type and rapidity of healing.

The paste was packed into the ulcer and covered so as to absorb seepage and be moisture proof. The dressings were changed on the fourth day, fresh paste being made for each dressing. Granulation and healing occurred rapidly in all cases and was especially noted in those ulcers where there was necrosis and infection. In all cases the growth of granulation tissue was observed after the third or fourth application. Bleeding occurred occasionally. Epithelial growth was slow until the ulcers filled with clean granulation. Ulcers in which firm scar tissue had already formed were most resistant.

While receiving this treatment, the patient continued on a partial rehabilitation program thus minimizing the development of other complications such as renal olculi and osteoporisis.

Influence of the Abdominal Muscle Tone on the Circulatory Response to Positive Pressure Breathing in Anesthetized Dogs

H. Bjurstedt, ACTA PHYSIOL. SCANDINAV., 29:145-162, October 1953. (Fasc. 2-3).

Factors contributing to the initial fall and secondary recovery of systemic mean arterial pressure under positive pressure breathing have been investigated in the dog under light to moderate sodium pentobarbital anesthesia.

Extensive opening of the abdomen, which removes the mechanical support for the abdominal venous reservoir, causes an exaggerated fall in the arterial pressure.

In the intact anesthetized dog the intra-abdominal pressure increases considerably less than the intrathoracic on application of positive intrapulmonic pressure. This is believed to promote venous pooling in the abdomen, which by reducing the effective blood volume available for the circulation contributes to the initial arterial pressure drop.

The intrathoracic-abdominal pressure difference secondarily diminishes while the lungs remain inflated by constant positive pressure. As a result cardiac output is assumed to increase again, thereby assisting in the secondary recovery of the arterial pressure.

The changes observed in the heart rate do not point to any major importance of the sinus and aortic mechanisms for the secondary recovery of the arterial pressure.

Some evidence is presented that the vagi may afford special reflex pathways, which by controlling the intrathoracic-abdominal differential pressure are important for the maintenance of venous return to the heart from the abdomen under increased intrapulmonic pressure.

Weight Training in Relation to Strength, Speed, and Co-ordination

John W. Masley, Ara Hairabedian, and Donald N. Donaldson, Research Quart., 34:308-315, October 1953.

From the data presented in this study, it appears that the contention that weight training contributed to a loss of coordination and speed of movement was refuted. Increased strength gained through a program of weight training where moderate poundage and increased repetitions were practiced apparently bore some association with increased coordination and speed, although it was not demonstrated that increased strength produced better coordination or more rapid movement.

On the basis of the data collected and within the reliabilities of the measures used in this study, the following conclusions seemed warranted:

1. A six week period of weight training increased strength more than a similar period of volleyball or inactivity.
2. A larger increase in speed and coordination resulted from six weeks of weight training than from volleyball or inactivity for a like period.
3. Increased strength gained through training with weights was apparently associated with increased muscular coordination and speed of movement.
4. Individual differences existed in gains and losses in both speed and coordination, since the test-retest correlations for the total group of 63 subjects were .55 and .54 respectively. These differences were not peculiar to any one group, but existed in all three. Strength test scores appeared to be highly consistent with a test-retest correlation of .97 for the total group.
5. Training with weights for a six-week period had no apparent deleterious effect upon the subjects.

Abstractors for February

Helen J. Hislop
Martha Wroe
Miriam J. Partridge

Book Reviews . . . . .

Bodily Physiology in Mental and Emotional Disorders. *By Mark D. Altschule, M.D., Assistant Professor of Medicine, Harvard Medical School, Boston; Director of Internal Medicine and of Research in Clinical Physiology, McLean Hospital, Waverly; Visiting Physician, Beth Israel Hospital, Boston. Cloth. Price, $5.75. Grune & Stratton, New York, 1953.*

This book was written for the internist and medical student by a physician who directed the internal medicine and research program at the psychiatric section of the Massachusetts General Hospital. It reviews over 2,000 references taken not only from the American, but also the English, French, Italian, Spanish, German, and Scandinavian literature.

The emotions have been known to affect bodily functions since ancient times. The author presents historical, together with up-to-date experimental information concerning the physiological changes observed in the normal, the neurotic, and psychotic person as a result of emotional stimuli. Each bodily system has a chapter devoted to it. Information relating such diseases as hypertension, urticaria, asthma, peptic ulcer, ulcerative colitis to the emotions are discussed. Similarly, there are chapters dealing with certain metabolic disorders which are accompanied by mental disturbances. The author states that there is no evidence that emotion causes the disease; however, emotional upset is important in exacerbation of diabetes mellitus. The physiology of emotional phenomena are related to adrenal, cortical, pituitary,

and thyroid functions. Because of such facts it is his belief that the psychiatrist should have a broad knowledge of medicine.

The book is well written, but the alphabetical arrangement of the bibliography is somewhat confusing. It is recommended as a reference book.

Instructional Course Lectures, Volume X. The American Academy of Orthopedic Surgeons. *Edited by Charles N. Pease, M.D. Cloth. Price, $12.00. Pp. 439 with illustrations. J. W. Edwards, Ann Arbor, Michigan, 1953.*

Volume Ten of the *Instructional Course Lectures of the American Academy of Orthopedic Surgeons* is a well prepared, printed, and illustrated series of lectures presented before the 1953 meeting of the Academy. Many of the articles are of interest to physical therapists, especially those concerned with orthopedics.

Chapter II presents the relatively new concept of traumatic arthrofibrosis by Dr. J. Vernon Luck. He discusses the etiology, pathogenesis, and treatment of the traumatic arthritides. He specifically discusses methods by which cartilaginous tissue is damaged or destroyed and the various clinical manifestations not demonstrable by X ray. Classification of the arthrofibroses is made and each is defined and discussed.

Chapter III is concerned with the spine. Dr. Ruth Jackson writes on the cervical spine illustrating pathological mechanisms. Dr. Paul C. Williams has an excellent chapter on the conservative management of lesions of the lumbosacral spine. This chapter is a "must" for anyone dealing with low back pain. There is also an article on Marie-Strumpell disease by Dr. Lenox D. Baker.

In Chapter VIII Dr. DeLorme discusses the vastly broadened scope of the Progressive Resistive Exercise Program since its introduction during the early days of World War II. He reemphasizes the value of preoperative resistive exercise, and has included disabilities other than fractures, such as tendon transplants. Detailed reports are given on the technique of ergography employed for studying various muscle groups exercising with heavy resistance. Another new concept that has been added in this field is the inclusion of the extreme age groups providing certain precautions and limitations are recognized.

Dr. Joseph E. Milgram writes on muscle ruptures and avulsions in Chapter IX. There is an interesting and thought provoking article on the Physiology of Joints by Dr. Ernest Gardner. The function of the hand following peripheral nerve injuries is adequately covered by Dr. J. Leonard Goldner. Five articles on bracing discuss the latest aspects of the art. There are also articles on amputations, traumatic paraplegia, and disability evaluations that are of interest.

To have between the covers of one volume, some of the current work of men such as Dr. Williams, Dr. DeLorme, Dr. Baker, Dr. Phelps and all the others make this book an integral part of any professional library. One needs only to compare this series of lectures with some of the previous editions to realize what tremendous strides have been made in the field of orthopedics. It is a readable, well edited, and highly informative piece of work.

This volume is of value for two reasons. It is a reference manual for various orthopedic procedures and it serves as a textbook for anyone desiring a better knowledge of the basic mechanisms of joint and low back disease.

Experimental Studies in Psychiatric Art. *By E. Cunningham Dax, B.Sc., M.B., B.S., D.P.M. Lately Medical Superintendent of Netherne Hospital, Coulsdon, Surrey; Chairman Mental Hygiene Authority, Victoria, Australia. Cloth; price $5.00. Pp. 100; illus. 51. J. B. Lippincott, Philadelphia, 1953.*

In this small book, *Experimental Studies in Psychiatric Art*, Dr. E. Cunningham Dax, formerly superintendent of Netherne Mental hospital in Surrey, England describes the results of experiments conducted over a four-year period, including the examination of 20,000 paintings done by patients who were mentally ill. His purpose was to assess the usefulness of this activity in psychiatric medicine. The patients were for the most part young, recoverable with treatment, and of at least average intelligence. This choice of subject eliminated deliberately the effect of deterioration which he suspected was present in most previously studied schizophrenic art. Standard conditions were maintained by offering to all patients identical materials. The role of the artist was a passive one, to encourage but not influence production. He helped the patients work out technical problems on separate sheets of paper. Notes were made of the manner in which patients painted and any comments they made about it at the time.

While the doctors were interested in the manner in which paintings were done, they never appeared in the studio, and patients accepted the explanation of the method that this was a form of treatment, they would paint for their doctors and none of their work was for display. In the second half of the book, music is assessed indirectly; that is, its effect on the patients is expressed in paintings undertaken during and immediately following the playing of a selected piece of music. This has the advantage that effects become visible, being recorded, and can be compared.

The most valuable and informative chapter discusses painting as an aid to diagnosis, as an aid to psychotherapy, and as illustrating signs and symptoms of the patients illnesses. The work of brain-injured patients including post-leucotomy cases is treated in a separate chapter as these paintings are characteristic and were used for a special purpose.

Dr. Dax has illustrated his discussion with more than fifty plates in black and white of his patients' paintings. His style is clear and readable, and his conclusions are conservative. In view of statistical results, Dr. Dax has been able to give the following answers to the problems he investigated: paintings may reflect the clinical illness closely, showing the same signs and symptoms present in clinical examination. They are important in diagnosis, and on occasion may have averted suicide attempts first recognizable in the patients paintings. Other useful information of a major sort uncovered early in the paintings has helped to shorten treatment. In particular the contents of conflicts have been portrayed. It is generally thought that creative activity can be of aid in treating the psychoneuroses. Paintings are treated as dreams, and the patients can be checked by inspecting their content. In addition, some patients express themselves much more freely in paint than with words, and are able to throw much light on the interpretation of symbolic material, independently of the analyst. This hastens their acceptance of the interpretations. It becomes a special form of psychotherapy, and could be used more frequently to advantage.

In the author's estimate, painting to music is one of the most in-

teresting of the experiments, as this appears to be the first time music has been statistically shown to be capable of producing certain effects — mainly in the area of mood changes. We are, however still not able to use this information therapeutically. He observes that, contrary to Dr. Licht's statement, quiet music at bed time arouses aggression among his disturbed patients, while a high-pitched flute obligato may prove soothing to some.

There were some patients who "painted themselves well." In this there is evidence as an undeterminable quotient the organizing power of a regular pleasurable occupation. In the psychoses, Dr. Dax felt no therapeutic results can be claimed for painting, unless one admits the obvious emotional release and emotional organization that results. Of the use of music, no therapeutic results can be claimed although some effects are noted. He found however that painting is useful to help assess the after-effects of cerebral injuries, supplying evidence not available through our present methods of psychological testing.

The author concluded that wider problems of the reciprocal relation between art and illness, particularly regarding release and motivation, might well be explored through a rearrangement of the results of this investigation. It is to be hoped he will pursue this theme further.

Two Studies in Education for Social Work. Professional Education Based in Practice. *By Rosa Wessel, Professor of Social Casework, University of Pennsylvania School of Social Work; and Goldie Faith, Associate Professor of Social Casework, University of Pennsylvania School of Social Work. Paper; price $3.00. Pp. 175. Published by Pennsylvania School of Social Work, Philadelphia, 1953.*

The two doctoral studies included in this volume describe the philosophical background, development, and actual working of the program of social work education at the University of Pennsylvania School of Social Work.

All recognized graduate schools in social work in the United States and Canada require field work for their students, the relation between classroom work and field training varies significantly from school to school. The Pennsylvania School's students all begin field work during their first weeks in school, on the theory that principles gain their first effective meaning from efforts of practice, and that the school's contribution then consists of building on that basic, growing meaning.

Miss Wessel's purpose for her study, "The Place of Practice in Education for Social Work," was to define the place that practice holds in training for social work and to show from the history of the profession what in practice has necessitated the persistence of the present day pattern. This she has done ably in four chapters which describe practice as a distinguishing factor in education for social work; relationship between profession and university; the meaning of learning in the supervisory relationship; and the nature of learning in practice.

The second study by Miss Faith describes the content, method and principles evolved thus far by her school in developing relationships with field agencies. While this process of development is characteristic of the University of Pennsylvania School, Miss Faith contends that the objective is one held in common by all those attempting to enhance the effectiveness of training for social work practice.

These studies should be highly interesting to those responsible for physical therapy education. The profession of physical therapy in its educational program is now placing more and more emphasis upon the student's awareness of his own behavior as a professional person as he operates within the person-to-person relationship of physical therapy practice. Both authors stress this emphasis and believe that the student's awareness of self is developed only through adequate supervisory relationship in an actual practice situation.

Aspects of the Psychology of the Tuberculous. *By Gordon F. Derner, Ph.D., Associate Professor of Psychology and Director of Clinical Psychology Training Program, Adelphi College, Garden City, New York. Paper; price $3.50. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York*

This psychosomatic medicine monograph of 110 pages is a compact little survey covering 32 patients, both male and female, at Grasslands Hospital, Valhalla, New York. The method of investigation included interviews, psychometric tests, rating scales and projective technics.

The purpose of the author's study is to attempt to discover some of the psychological factors arising from tuberculosis, including the disease itself and its concomitants. He lists some of the concomitants as social ostracism, lengthy treatment process, possible surgery, possible death, arrestment rather than cure, institutionalization, tremendous financial cost, and constant post-hospital vigilance against relapse.

Dr. Derner does not attempt to explore the field of unconscious psychodynamisms which prepare the patient for tuberculosis, nor does he give a conclusive psychosomatic portrait. He mainly concerns himself with the general attitudes, feelings, personality factors, and intellectual factors found among hospitalized tuberculosis patients.

The study is confined to a small number of patients and, therefore, is too limited in its scope to be considered as a textbook. It could serve as reference material. For instance, there is the large body of veterans who represent the ex-serviceman — the psychological factors there might indicate a somewhat varied set of findings.

Obviously the author has been thorough in his study and a great deal of effort has been put into his work so far as it goes. He lists 13 items under *Summary and Findings* which this reviewer finds, on the whole, acceptable in her experience. The implications from his findings seem all too simple and obvious in view of the enlightenment existing amongst workers who are in daily contact with the tuberculous. Perhaps the author is thinking of the vast public which is ignorant and often intolerant of those who have, or had, the disease. But, by the nature of the monograph (a sort of doctor's thesis), these findings will not reach the vast public. It is replete with questionnaires, and statistics, in order to serve as a scientific study. The author lists a large bibliography of which not the least is E. Wittkower's book, "A Psychiatrist Looks at Tuberculosis." In Mr. Derner's own works "a broad study of the tuberculous."

Where this book can be of service is to new workers in the field of tuberculosis and to students who are doing clinical practice. I refer to occupational and physical therapists. It would give them an insight into the various problems the tuberculous patient faces.

Notice to all Members

RESEARCH AND CLINICAL STUDIES SECTION

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Abstracts of papers to be read at the 31st annual meeting of the American Physical Therapy Association which meets in Los Angeles, California, June 27 to July 2, are due in the National Office, 1790 Broadway, New York 19, on or before March 15, 1954.

Abstracts should be not more than 250 words long, or one typewritten page, double-spaced.

Abstracts should be sent in triplicate to expedite review by the Research and Clinical Studies Committee.

Abstracts should have a concise but inclusive title. Other information required is the full name of the author or authors, degrees held, position and the institution where the work was done.

Papers will be selected and essayists notified by April 1st. Following the custom established in 1952, discussants will be selected from the membership of the Association.

Papers are due in the National Office by May 15.

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